

**JUDICIAL ASSESSMENT OF FORENSIC EVIDENCE:
A STUDY OF JUDGE’S GATEKEEPING FUNCTION**

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JINDAL GLOBAL LAW SCHOOL

**SUBMITTED
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE
OF
DOCTOR OF PHILOSOPHY IN LAW
TO**

**O.P. JINDAL GLOBAL UNIVERSITY
SONIPAT, HARYANA
MARCH, 2023**

**UNDER THE GUIDANCE OF
DR. KASIM BALARABE
PROFESSOR
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ACKNOWLEDGEMENTS

The impact of support and encouragement on a person's ability to effectively perform a task was revealed to me in the course of my journey as a doctoral research scholar. Assistance and guidance of numerous people has been instrumental in the completion of this research. These people have my genuine gratitude and appreciation, which go beyond any words I could possibly use to thank them.

I would like to express my sincere gratitude to my Supervisor Prof. (Dr.) Kasim Balarabe, Professor and Associate Dean, Jindal Global Law School, O.P. Jindal Global University, Sonipat, Haryana. His guidance, patience and kindness have helped me improve the quality of the research. His sharp focus on minute aspects taught me the relevance of each and every detail in research. I feel blessed that I was given the opportunity to work under his supervision. I wish to show my appreciation to Prof. (Dr.) Vipin Vijay Nair, Assistant Professor and Assistant Dean, Jindal Institute of Behavioural Sciences, O.P. Jindal University, Sonipat, Haryana for providing assistance as a member of research advisory committee. I wish to express my deepest gratitude to Prof. Dabiru Sridhar Patnaik, Professor and Registrar, O.P. Jindal University, Sonipat, Haryana. I am deeply indebted to Prof. (Dr.) C. Raj Kumar, the founding Vice-chancellor of O.P. Jindal University, Sonipat, Haryana for providing scholarship and financial assistance for the completion of this project.

Finally, I would like to thank my husband and other family members for being a strong pillar of support. My family has been a source of love and strength through thick and thin. My parents have taught me to always pursue excellence. These values have made it possible for me undertake and complete this research.

DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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This is to certify that the thesis entitled “Judicial Assessment of Forensic Evidence: A Study of Judge’s Gatekeeping Function” is being submitted by Kanika Aggarwal in fulfillment for the Award of DOCTOR OF PHILOSOPHY in Jindal Global Law School to the O.P. Jindal Global University, Sonipat. Thesis has been corrected as per the evaluation reports dated and all the necessary changes / modifications have been inserted/incorporated in the thesis.

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EXECUTIVE SUMMARY

Forensic science could be, both, a handmaiden of justice and a threat to justice. Forensic science is a boon to justice system, provided a judge can sift out the misleading/unreliable forensic evidence. It is a bitter truth that unbridled and unrestricted use of forensic evidence has led to miscarriage of justice. The use of DNA technology has made it possible to review judicial decisions. As a result of case reviews, it has come to fore that misapprehension of the forensic evidence has led to wrongful convictions. Consequently, examination of reliability of forensic techniques is being undertaken by members of scientific community. Also, the legal framework governing application of forensic evidence is also being evaluated in various jurisdiction. Surprisingly unlike other jurisdictions, there is a serious dearth of discussion around this issue in Indian contemporary legal jurisprudence, despite the fact that danger of wrongful conviction is alike for all countries. This has remained an unexplored area of scholarship in India. The lackadaisical approach towards such a non-trivial matter that has potential of jeopardising the lives of innocent people is a cause of concern. Not just individual freedom but also the integrity of Indian judicial system is at stake. There is an urgent need to address the issues that have been raised in the study. The original contribution of the study lies in the fact that it would not just highlight the need to revamp India's approach towards forensic evidence but would also make suggestions based on laws, safeguards, standards and practices that other countries have adopted in this regard.

In view of these developments, the present research is intended to study the robustness of the legal framework relating to forensic evidence in India. Further, the analysis of the manner in which the legal framework is being applied in India is also part of the study. Accordingly, the three research questions that the study seeks to answer are: What are the legal practices for making the gatekeeping function of judges most effective in other jurisdictions? How do the courts in India assess the reliability of a particular forensic technique? Whether the Indian legal system has adequate safeguards/mechanisms to save it from the danger of totally/partially unreliable forensic evidence/testimonies? The answer to these research questions has been sought with the help of a combination of doctrinal and empirical research methods.

The first research question is: What are the legal practices for making the gatekeeping function of judges most effective in other jurisdictions? The answer to this research question is being sought by comparison of legal rules and practices regarding the evaluation of forensic evidence in various common law jurisdictions. The countries chosen for this comparative study, on the basis of their legal system, are the United States, England, Australia, Canada, South Africa, and Singapore. The laws and judicial decisions regulating expert evidence are a source of guidance for judges on how expert evidence is to be assessed. Examining the legislative framework governing expert evidence is critical for gaining knowledge of the legal practices prevalent in various countries. Apart from specific legislative provisions, it was discovered that jurisprudence concerning expert evidence has evolved via judicial decisions. The study is premised on the examination of the following resources from each of the above-mentioned countries: Statutory rules and regulations governing the use of expert testimony, relevant judicial decisions, and secondary legal sources, such as journals, essays, and articles. Analysis of the legal framework of various jurisdictions revealed that expert evidence, its peculiar nature and limitations have been historically recognised in various common law countries. All these countries require that the basis of the expert opinion shall be clearly elucidated in the expert report. Most important thing to note is that a trend has been observed towards codification or refinement of the rules governing expert evidence by way of amendment. It has been experienced in the past that explicit provision of law in relation to duties of an expert has enhanced the monitoring of expert's conduct by judges. The study has demonstrated that erroneous decisions owing to expert evidence are a global concern. Different jurisdictions have brought about certain suitable changes in their legal framework to introduce provisions such as statutory reliability test, discretion to exclude prejudicial or unfair evidence, the appointment of an expert by court and the duties of an expert. It is believed that statutory incorporation of these provisions would enhance the judicial scrutiny of forensic evidence.

The second research question is how do the courts in India assess the reliability of a particular forensic technique? The question has been answered in two parts. The first part constitutes interviews with judges about their experience with forensic evidence. Judges play a central role in admitting and evaluating forensic evidence. Judges are mostly not

asked to express their views on the manner in which they assess forensic evidence. Understanding the interaction of legal rules and practices with forensic science lies at the heart of the study. Drawing on the responses of trial court judge to the survey, the study presents empirical evidence regarding the judicial opinion concerning gatekeeping function. 20 judges from district courts in New Delhi were interviewed with the help of the snowballing technique. In addition to assessing the scientific literacy of the judges, the study involved asking questions relating to methods used by judges for determining the reliability of forensic technique. The research showcased that a common perception among judges is that it is safe to seek corroboration of forensic evidence. And the extent to which corroboration shall be sought is dependent on the nature of the technique. It is crucial to note that the judges appeared to be less worried about the reliability assessment of the forensic approach since there is always additional corroborative evidence to complete the chain of events. Thus, even if the forensic approach is faulty, the other evidence would make up for the inaccuracy. Corroboration is regarded as the cure for all the limitations of forensic evidence. All the participants of the study categorically affirmed that judicial training in forensics is inadequate. The responses of the participants indicate that not just the time duration but also the scheduling of the training is inappropriate. Judicial training is imparted in the first years after selection as a judicial officer. At this stage, judges have no experience in appreciating evidence. Further, the power to appoint a neutral expert is seldom exercised in reality. The courts prefer that parties present evidence to the court in accordance with their interests. Most importantly, the judges were not familiar with any reliability test for assessment of forensic evidence. The study also demonstrated that reliance on cross-examination for assessment of the reliability of forensic evidence is the most prevalent practice. The reference to scientific literature for evaluation of forensic evidence was rare. Judges resort to other non-scientific methods of evaluating forensic evidence that are well-understood by them, such as cross-examination, expert's qualification, legal precedents etc. It is due to judges' lack of scientific knowledge that forensic evidence is evaluated using superficial criteria. The judges demonstrated a long-standing faith and trust in the trial systems' capabilities even with respect to matters that demand scientific scrutiny.

The second limb of the second research question involved review of judgements from the district courts in Delhi ranging from Jan, 2016 to Dec, 2020, i.e., 5 years. Published

judgments of trial court provide an insight into the kind of challenges that are raised against admission of forensic evidence and also the pattern of judicial responses. An attempt was made to extensively deconstruct and examine the judgements wherein the reliability of forensic evidence is being examined in order to establish the strategy/standards employed by judges while dealing with issues of reliability of forensic evidence. It was revealed that there was no mention of the limits of forensic evidence, such as the potential of errors or subjectivity, in the judgements. The terminology employed in the expert's reports indicates a high degree of assurance for outcomes that lack scientific basis. Objections to forensic evidence are mostly procedural and have no bearing on the epistemic defects inherent in the use of a forensic approach. Importantly, a technique's reliability is proven with the use of judicial precedents, but scientific literature is seldom cited. Consequently, the most recent scientific advancements are excluded from the debate and interpretation of forensic evidence. Cross-examination and reliance on precedents are the two primary sources for demonstrating the credibility of forensic evidence. Scientific literature, the most pertinent and direct source of scientific information, is seldom cited.

In view of the findings, it is recommended that a rule incorporating reliability as a condition for admissibility may be added to the Indian Evidence Act. Further, it is recommended that the judicial academy may impart regular and compulsory training to all judges in forensic techniques. The extent of training need not be the same as that imparted in medical or technical colleges. It could be limited to the extent that would enable judges to carry out gatekeeping function efficiently. Judges only need to become critical consumers of the forensic sciences. Lastly, it is recommended that the practice of appointing neutral experts by that courts shall be encouraged.

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1.0 THE FRAMEWORK OF THE STUDY

1.1 PROLOGUE

In the present scientific era, where access to the internet has attained the status of a fundamental right,¹ it is imperative that institutions, especially those in public service, keep pace with technological advancements. It is postulated that society in the first 25 years of the 21st century will witness 100 years' worth of progress and innovation.² The importance of science and technology has also been acknowledged in the Constitution of India itself in the chapter dealing with Fundamental Duties. Article 51A(h) of India's Constitution states that it shall be a fundamental duty of all citizens to endeavour to develop scientific temper.³ Emphasis is being laid on infusing new technology in legal education as well, to prepare law students for the use of technology in their professional lives.⁴

Just as society is becoming more technologically advanced and simultaneously complex, crimes also are being committed in more complex and technical forms. The legal system of the country has been making efforts to make technology its intrinsic part. The Supreme Court of India in *Dharam Deo Yadav v. State of U.P.* has raised the issue of encompassing science and technology in the legal system.⁵ The court held that the only way to ensure that hardened criminals do not go scot-free for want of evidence is that the investigation agency shall focus on collection of forensic evidence as the forensic evidence are devoid of vices such as forgetfulness, undue influences, humiliation etc. Most important the court pointed out that "judiciary should also be equipped to understand and deal with such scientific materials."⁶

¹ *Faheema Shirin v. State of Kerala*, 2019 (4) KHC 901, para 18.

² Raymond Kurzweil, *Why You Should Read "The Singularity is Near: When Humans Transcend Biology"*, PREDICT <https://medium.com/predict/why-you-should-read-the-singularity-is-near-when-humans-transcend-biology-f8066b5921ed> (last visited May 7, 2021).

³ INDIA CONST., Art. 51A, cl. (h).

⁴ Schukoske, J.E., *Legal education reform in India: Dialogue among Indian law teachers*, JINDAL GLOBAL L. REV. 251,262 (2009).

⁵ *Dharam Deo Yadav v. State of U.P.*, (2014)5SCC509, para 25.

⁶ *Ibid.*

The need for interaction of law and science has paved the way for emergence and growth of forensic science as handmaiden of the legal system.⁷ Forensic science includes the use of science and technology for the purposes of law and has become a potent tool in the hands of judiciary and the law enforcement agencies at both national and international levels.⁸ The importance of forensic evidence in resolving legal matters is beyond doubt.⁹ It not only helps in apprehending the guilty but also in freeing the innocent. Forensic science has great potential to help in achieving speedy and accurate justice delivery system. There are a variety of ways in which forensic science assists the legal system. Forensic Science can be used at the time of investigation, or at the trial as evidence. For example, in the killing of IS leader Abu Bakr al-Bhagdadi, the identity of the deceased was confirmed using DNA¹⁰ from his clothing obtained secretly by a spy.¹¹ DNA test in paternity cases is widely used, though judiciously and not in regular course. Given the personal and ethical nature of the issues involved, in some cases the person is given liberty to comply or disregard an order of undergoing DNA examination.¹² But, once the DNA test has been conducted, its result cannot be neglected even if the presumption of Section 112¹³ of the Indian Evidence Act, 1872, which relates to presumption of paternity of the husband in wedlock, applies. Bearing in mind the widespread use and importance of forensic science and forensic evidence in court, there have also been suggestions for considering forensic evidence as substantive/conclusive evidence.¹⁴

Most importantly the discovery of DNA has revolutionised the whole scope of forensic science. Perhaps it is the only method in the world of forensics that has consistently and

⁷ D.L. Faigman, M.J. Saks, J. Sanders, and E.K. Cheng, *Modern Scientific Evidence: The Law and Science of Expert Testimony*, EAGAN 6 (2008).

⁸ *Forensics*, INTERPOL <https://www.interpol.int/en/How-we-work/Forensics> (last visited May 7, 2021).

⁹ *Convicted By Juries, Exonerated By Science: Case Studies In The Use Of Dna Evidence To Establish Innocence After Trial*, NATIONAL INSTITUTE OF JUSTICE (Jun., 1996) <http://www.ojp.usdoj.gov/search97cgi/s97.cgi> (last visited May 7, 2021).

¹⁰ “The DNA stands for deoxyribonucleic acid, which is the biological blueprint of every life.” *Dharam Deo Yadav v. State of U.P.*, (2014) 5 SCC 509.

¹¹ *Abu Bakr-al-Bhagdadi: IS Leader's Underwear 'stolen' for DNA test*, BBC NEWS, <https://www.bbc.com/news/world-middle-east-50218637> (last visited May 7, 2021).

¹² *Amrutlal Amthabhai Mistri v. Ashwinikumar Amrutlal Mistri*, Gujarat HC, (Oct. 24, 2019).

¹³ “The fact that any person was born during the continuance of a valid marriage between his mother and any man, or within two hundred and eighty days after its dissolution, the mother remaining unmarried, shall be conclusive proof that he is the legitimate son of that man, unless it can be shown that the parties to the marriage had no access to each other at any time when he could have been begotten.”

¹⁴ MINISTRY OF HOME AFFAIRS, REPORT OF THE COMMITTEE ON DRAFT NATIONAL POLICY ON CRIMINAL JUSTICE, at 27 (July, 2007).

rigorously shown the capacity to match with a great degree of certainty an evidentiary sample and a source sample.¹⁵ The *State v. Sushil Sharma* or the Tandoor Murder case,¹⁶ as it is popularly known, is a landmark judgment wherein DNA testing played a crucial role in establishing the guilt of the accused. Given there is proper sampling, quality control and no tampering with DNA evidence, it is considered as exact and most accurate piece of evidence.¹⁷

The use of forensic evidence dates back to the Roman Empire.¹⁸ Post-World War I, development and application of forensic science, and the establishment of forensic laboratories began in different parts of the world. The National Laboratory in U.S. founded in 1932 by the Federal Bureau of Investigation is the world's largest forensic science laboratory.¹⁹ The laboratory was designed to provide forensic assistance to the law enforcement agencies in the USA. After the end of World War II, a rapid spurt was seen in advancement and establishment of forensic institutes in western countries. It is only in the second half of the twentieth century that forensic science came into existence in India.²⁰ It is praiseworthy that the first Fingerprint Bureau of the world was established in India at Calcutta (now Kolkata) in the year 1897.²¹ Post-independence, certain rapid developments were made. In an effort to strengthen the forensic institutions in India, various committees have been examining the inadequacies and impediments that hamper the development of forensic science in the country. It was realised that in order to have constant upgradation of forensic service activities, there is a need for the integration of all the Central Forensic Science Institutions under one umbrella by the Ministry of Home Affairs. Consequently, by Order no. 25011/41/2001-GPA.II/PM-II on December 31, 2002, the Directorate of Forensic Science Services (DFSS) was created after its bifurcation from Bureau of Police Research and Development (BPRD). DFSS is now the nodal agency of

¹⁵ COMMITTEE ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIENCES COMMUNITY, NATIONAL ACADEMY OF SCIENCES, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD, NATIONAL RESEARCH COUNCIL 100 (2009).

¹⁶ *State v. Sushil Sharma*, 2007 CriLJ 4008 (Delhi HC).

¹⁷ *Mukesh and another vs. State (NCT of Delhi) and others*, (2017) 6 SCC 1 (Nirbhaya case); *Dharam Deo Yadav vs. State of Uttar Pradesh*, (2014) 5 SCC 509.

¹⁸ FORBES, <https://www.forbes.com/sites/kristinakillgrove/2018/11/28/these-three-forensic-science-techniques-from-ancient-rome-reveal-shocking-gaps-in-modern-methods/?sh=69bc405a58fe> (last visited May 7, 2021).

¹⁹ B.S. NABAR, FORENSIC SCIENCE IN CRIME INVESTIGATION 3 (3d ed., Asia Law House 2018).

²⁰ *Id.* at 4.

²¹ *The History of Fingerprints*, LATENT PRINT EXAMINATION, <http://onin.com/fp/fphistory.html> (last visited May 7, 2021).

the Government of India and coordinates the development of forensic sciences in the country.²² Also, three new Central Forensic Science Laboratories (CFSL) were set up in 2011 bringing the total number of CFSL in India to seven. Though, this is still far from being sufficient. As noted by the Supreme Court of India, “in the entire country there are only seven Central Forensic Science Laboratories. Ideally, there should be at least one Central Forensic Science Laboratory in every State. Lack of facilities and inadequate manpower to deal with scientific and forensic aspects of investigation definitely delays the entire process.”²³ It shall be seen in chapter 5, section 5.6.3, that the courts send forensic evidence for examination to the government-run forensic laboratories. Though the courts are free to appoint a private expert for examination, the general practice is to refer the matter to the government laboratories. Heavy work load in these laboratories and, resultant, delay in examination of forensic evidence is a major reason why courts are reluctant to get forensic evidence examined in cases that are considered less serious in nature.

Forensic Science has become an integral part of the Indian legal system. Alongside the numerous benefits of incorporating forensic science in legal arenas, there exist plentiful hurdles/challenges in ensuring rightful use of forensic evidence in courts. One such limitation is lack of scientific foundation, i.e., the basis of the technique is not scientifically supportable.²⁴ Various authoritative bodies, having both forensic scientists and legal personalities as members, have time and again asserted that none of the forensic science techniques, barring DNA technology, have the potential of being exact sciences.²⁵ Moreover, some of the forensic techniques, such as tool mark, odontology, are bereft of validation studies.²⁶ In simpler terms, not all forensic techniques are reliable.²⁷ More importantly, judges rely on expert reports unmindful of the true probative worth and

²² Ministry of Home Affairs, *Directorate of Forensic Science Services*, GOVT. OF INDIA, <http://dfs.nic.in> (last visited May 7, 2021).

²³ *Dilawar v. State of Haryana*, SC (decided on Jul. 16, 2019).

²⁴ National Research Council, *Strengthening Forensic Science in the United States: A Path Forward*. Washington, DC: National Academies Press, 99 (2009).

²⁵ National Research Council, *Strengthening Forensic Science in the United States: A Path Forward*. Washington, DC: National Academies Press, 2009; President's Council of Advisors on Science and Technology, *Report to the President Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*. Washington, DC: Executive Office of the President, 2016.

²⁶ National Research Council, *Strengthening Forensic Science in the United States: A Path Forward*. Washington, DC: National Academies Press, 127 (2009).

²⁷ *Id.* at 182.

degree of reliability of the claims made by a forensic expert.²⁸ The limitations of a forensic technique are not always spelled out by the experts. In fact, experts tend to exaggerate the findings of the forensic examination. Reliance on faulty forensic testimonies has resulted in wrongful conviction.²⁹ 111 such cases have been documented by project Innocence.³⁰ For instance, Habib Wahir Abdal was convicted for the crime of rape on the basis of the victim's identification and testimony of hair analyst. Both the evidence were nullified by the court after 16 years with the help of DNA evidence.³¹ In India, there have been wrongful decisions because the trial court either relied on unreliable forensic report or the report was inappropriately understood by the judge.³² In the case of *Nnadi K. Iheanyi v. Narcotics Control Board*,³³ the trial court relied on expert testimony to determine whether or not the sample of drug that was preserved as evidence was contaminated or not. The expert testimony was later found to be unscientific and unreliable by the Delhi High Court. The wrongful decision of the trial court was overturned by the High Court. A glaring example of misapplication of forensic evidence leading to wrongful conviction is *State of Rajasthan v. Komal Lodha*.³⁴ In this case, the forensic evidence and report was not faulty but it was the misapprehension of the report by the court that led to wrongful conviction. It is highly surprising that the trial court and the high court of Rajasthan misunderstood the forensic report. The case involved accusation of rape and murder. The DNA report mentioned that two set of DNA were recovered from victim and accused each. Out of the two set of DNA recovered from accused, one matched with his DNA profile and the other matched with one of the two DNA profiles recovered from the victim. But none of the two DNA profiles recovered from victim matched with the DNA of the accused. Yet, he was convicted and awarded death sentence. The error was noticed in the review petition by a division bench of the same High Court.

²⁸ *Id.* at 53.

²⁹ *Id.* at 53.

³⁰ INNOCENCE PROJECT, <https://innocenceproject.org/all-cases/#unvalidated-or-improper-forensic-science> (last visited Nov. 1st, 2022).

³¹ Habib Wahir Abdal, INNOCENCE PROJECT, <https://innocenceproject.org/cases/habib-wahir-abdal/> (last visited Nov. 1st, 2022).

³² *Nnadi K. Iheanyi vs. Narcotics Control Bureau*, MANU/DE/2069/2014; *State of Rajasthan v. Komal Lodha*, D.B.Criminal Reference No. 6/2019, decided by Rajasthan High Court.

³³ MANU/DE/2069/2014.

³⁴ D.B.Criminal Death Reference No. 6/2019, Rajasthan HC.

The debate relating to wrongful conviction owing to unreliable or misunderstood forensic testimonies has raised questions about the efficacy of safeguards in the legal framework and practices. The focal point of this research is to analyse the safeguards against unreliable forensic evidence. The key concern of the research is to examine whether present evidentiary laws and practices are robust enough to ensure that forensic evidence are accurately applied in the process of judicial decision making.

1.2 CONCEPTUAL/THEORETICAL FRAMEWORK

Derived from Latin word *forensis*, the word FORENSIC's root refers to 'forum' i.e. professional, political, or legal gathering.³⁵ Whereas the definition of SCIENCE is "knowledge attained through study or practice."³⁶ Thus, the term forensic science can be said to mean use of scientific knowledge for the purposed of law.³⁷ In other words, forensic science is use of science for the purposes of law. And, the evidence so derived with the help of forensic sciences are called forensic evidence. Forensic Science, in broad terms, can be defined as "that scientific discipline which is directed to the recognition, identification, individualisation, and evaluation of physical evidence by the application of the principles and methods of natural sciences for the purpose of administration of criminal justice."³⁸ This definition seems to be restrictive in its scope as it is limited to criminal case. Whereas the use of forensic in civil cases³⁹ is widespread, for instances in cases of paternity determination, claims under Motor Vehicles Act,⁴⁰ medical negligence, handwriting analysis in dishonour of cheque cases etc. Therefore, more suitable definition of forensic science would be, "a group of scientific disciplines which are concerned with application of their particular scientific area of expertise to law enforcement, criminal, civil, legal and judicial matters."⁴¹ Accordingly, forensic scientists are the ones who carry

³⁵ *R. v. Dlugosz, Pickering*, [2013] EWCA Crim 2.

³⁶ WEBSTER'S NEW COLLEGIATE DICTIONARY 1051 (9th ed. 1991).

³⁷ SARITA JAND, *FORENSIC SCIENCE AND LAW 1* (1st ed. 2017); NATIONAL COMMISSION ON FORENSIC SCIENCE, *DEFINING FORENSIC SCIENCE AND RELATED TERMS* (April 30, 2015) www.justice.gov/ncfs/file/786571/download (last visited May 7, 2021).

³⁸ B.S. Nabar, *FORENSIC SCIENCE IN CRIME INVESTIGATION 1* (3rd ed. 2018).

³⁹ Setia H, *Evidentiary Value of Forensic Reports in Indian Courts*, 1 (2016).

⁴⁰ Motor Vehicles Act, 1988, No. 59, Acts of Parliament, 1988 (India).

⁴¹ Sati M, *Evidentiary Value of Forensic Report in Indian Courts*, SCHOLARTICLES (Feb. 11, 2016), <https://scholarticles.wordpress.com/2016/02/11/ms1/> (last visited May 7, 2021).

out the analysis and examination of forensic evidence and thus, provide necessary assistance in the investigation and prosecution of crime.⁴²

Forensic Science as a whole encompasses a wide spectrum of disciplines. These disciplines include a wide variety of methodology, techniques, etc.⁴³ Forensic science includes all branches of pure sciences such as physics, chemistry, and geology. For example, the physical evidence of living things are studies with the help of biology; Chemical properties of substance like urine, ink, alcohol, drugs etc., are studies with the help of Chemistry division. Certain branches of forensic science have been developed primarily for forensic purposes, like, ballistics, anthropometry, serology, fingerprints, documents, odontology etc.

For a comprehensive understanding of the term ‘forensic evidence’, it is suitable that the term evidence is made abundantly clear. The term ‘evidence’ is derived from the Latin word ‘*evident*’ or ‘*evidere*’, which means “to show clearly, to discover clearly, to ascertain, to prove.”⁴⁴ Evidence may be documentary, testimonial or any tangible object.⁴⁵ As per section 3 of the Indian Evidence Act, evidence are “all statements which the Court permits or require to be made before it by witnesses, in relation to matters of fact under enquiry. Such statements are called oral evidence. And, all documents produced for the inspection of Court, are called documentary evidence.” In other words, evidence may be defined as any material which would aid the court in establishing the probability of past events into which it must enquire.⁴⁶ Evidence are considered as the eyes and the ears of the Court. This is why a judge becomes helpless in the absence of evidence. Taking note of the same, one notable Supreme Court judge, Honourable Mr. Justice DY Chandrachud, once said “this is one of the greatest torments of being a judge to have to decide on the basis of evidence as it stands.”⁴⁷ Evidence are the tools that empower a judge to decide upon a matter which has already occurred and is not a part of the personal knowledge of the court. The two opposing parties in a case are given opportunity to present their

⁴²Forensic Science, THE UNITED STATES DEPARTMENT OF JUSTICE <https://www.justice.gov/olp/forensic-science> (last visited May 7, 2021).

⁴³ COMMITTEE ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIENCES COMMUNITY, NATIONAL ACADEMY OF SCIENCES, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD, NATIONAL RESEARCH COUNCIL 7 (2009).

⁴⁴ LAW OF EVIDENCE, UNIVERSAL LAW SERIES (4th ed., 2016).

⁴⁵ BLACK'S LAW DICTIONARY 575 (7th ed., 1999).

⁴⁶ RICHARD GLOVER & PETER MURPHY, MURPHY ON EVIDENCE 3 (13th ed., 2013).

⁴⁷*Pehlu Khan Lynching case: Justice Chandrachud speaks on verdict, rues ‘Shoddy Probe’ in Some Cases*, India.com (Aug. 18, 2019), <https://www.india.com/news/india/justice-chandrachud-rues-alwar-lynching-verdict-3748458/> (last visited May 7, 2021).

evidence. And, it is for the judge to determine which evidence is relevant, reliable, admissible and deserves how much weightage in order to arrive at a just decision.⁴⁸

Unregulated administration of evidence can lead to chaos in courts. This is where the relevance of the Indian Evidence Act, 1872 lies. Indian Evidence Act, 1872 is the principal legislation that governs the issues relating to evidence both in Civil and Criminal cases in India. The law of evidence is aimed at ensuring that the courts is presented with only such evidence that would help that court in reaching a reliable and just decision.⁴⁹ Though, there are certain sections which apply exclusively to civil cases and, some to criminal cases.⁵⁰ The rules enumerated in the Act are the guide for both the lawyers and the judges. There are three closely connected concepts in relation to evidence that ought to be made clear at the outset. These are:

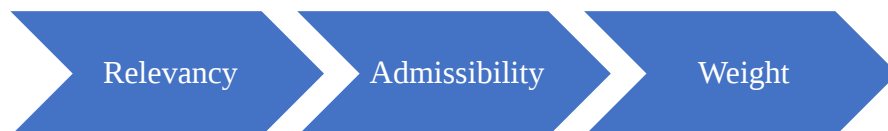


Figure 1-0-1

For a piece of evidence to be determinative in deciding a case, it has to be relevant, admissible and shall also have some degree of probative worth/weight. Relevance refers to the capacity of a fact to render “the fact to be proved more probable than it would be without that evidence.”⁵¹ It can also be said that “evidence is relevant if it makes a fact in issue to any degree more likely or less likely to be true than it would be without the evidence.”⁵² There are two approaches to relevance, one is logical relevance and the other is legal relevance. Logical relevance is based on logic or some casual connection between two events.⁵³ Legal relevance, on the other hand, requires “higher standards of evidentiary force.”⁵⁴ Indian Evidence Act has adopted the legal relevance approach. This means that evidence is relevant if it is so provided in the Evidence Act itself, irrespective of the logic. According to section of 3 of the Evidence Act, evidence is relevant to a case if the

⁴⁸ *Malay Kumar Ganguly v. Dr. Sukumar Mukherjee*, (2009) 9 SCC 221.

⁴⁹ *Ramesh Chandra v. Regency Hospital*, (2009) 9 SCC 709.

⁵⁰ MALIK A, LAW OF EVIDENCE 5 (7th ed., 2017).

⁵¹ CHOO, ANDREW L-T, EVIDENCE, OXFORD UNIVERSITY PRESS 3 (2nd ed., 2009).

⁵² RICHARD GLOVER & PETER MURPHY, MURPHY ON EVIDENCE 16 (13th ed., 2013).

⁵³ M.MONIR, THE LAW OF EVIDENCE 46 (2015).

⁵⁴ *Ibid.*

connection between the evidence and the case or a fact in issue in the case is covered by section 5 to 55 of the Act. These sections determine the legal relevance of evidence. Legal relevance is, also, described, by *Andrew*, as a fact which logically relevant and has some additional value.

$$\text{Logical Relevance}^{55} + \text{'Plus Value'} = \text{Legal Relevance}^{56}$$

The 'plus value' in the above equation is representative of possible considerations/disadvantages of admitting evidence such as prejudice to the defendant, the introduction of collateral issues, delay, confusion etc.⁵⁷ Thus, what is legally relevant is also logically relevant, but the reverse may not be true.⁵⁸ For instance, a confession made in police custody is logically relevant though only minimally; it is not legally relevant u/s 27 of the Indian Evidence Act.

Second stage for evidence to pass through is that of admissibility.⁵⁹ It means receivability in evidence.⁶⁰ All the relevant evidence, logical or legal, depending on what is recognised in a particular legal system, that do not infringe any of the exclusionary rules or are not excluded by way of judicial discretion are considered as admissible.⁶¹ Admissibility presupposes relevancy. Whereas, the reverse is not true and presence of certain rules of exclusion makes relevant evidence inadmissible.⁶² The exclusionary rule principle is basically twofold –

1. Exclusion on the basis of rule of law or public policy – for instance, opinion evidence is not admissible, communication between husband and wife are privileged communication and are not admissible in courts as evidence.⁶³
2. Recognised exceptions – like secrets of state, privileged communications, etc.⁶⁴

⁵⁵ "Logical relevance is when evidence in a logical sense, to whatever extent, renders a fact-in-issue probable or improbable. It is mostly governed by logic, experience and common sense." RICHARD GLOVER & PETER MURPHY, *MURPHY ON EVIDENCE* 26-27 (13th ed., 2013).

⁵⁶ CHOO, ANDREW L-T, *EVIDENCE*, OXFORD UNIVERSITY PRESS 3 (2nd ed., 2009).

⁵⁷ *Id.*, at 3.

⁵⁸ M.MONIR, *THE LAW OF EVIDENCE* 46 (2015).

⁵⁹ *Ibid.*

⁶⁰ *Ibid.*

⁶¹ CHOO, ANDREW L-T, *EVIDENCE*, OXFORD UNIVERSITY PRESS 2 (2nd ed., 2009).

⁶² RICHARD GLOVER & PETER MURPHY, *MURPHY ON EVIDENCE* 26 (13th ed., 2013).

⁶³ M.MONIR, *THE LAW OF EVIDENCE* 46 (2015).

⁶⁴ MALIK A, *LAW OF EVIDENCE* 15 (7th ed., 2017).

And lastly, weight of the evidence which means “Qualitative assessment of the probative value which admissible evidence has in relation to the facts in issue.”⁶⁵ The Supreme Court has categorically differentiated between admissibility and weight (probative value) of the evidence in the case of *Madan Mohan Singh v. Rajni Kant*.⁶⁶ The court in the case has held that a document may be admitted in evidence in a case, but the probative value of the content of the document may vary depending upon the facts and circumstances of the case. Weight refers to the persuasive value of evidence which is attached to it by the judge in a particular case. It is not practically feasible to lay down rules or guidelines to weigh evidence.⁶⁷ Weight of evidence is a matter of fact and depends on multiplicity of factors that are hard to innumerate.⁶⁸ For instance, demeanour of the witness, credibility of an eye witness etc., are the factors that may vary the weight of testimonial evidence presented by witness. The question of weight of evidence arises only after it has been found to be relevant and admissible. The three concepts are closely bound up.

As regards Forensic evidence, the relevance is determined by Section 45 of the Indian Evidence Act. Section 45 of the Evidence Act says that –

Opinions of experts - When the Court has to form an opinion upon a point of foreign law or of science or art, or as to identity of handwriting [or finger impressions], the opinions upon that point of persons specially skilled in such foreign law, science or art, [or in questions as to identity of handwriting] [or finger impressions] are relevant facts. Such persons are called experts.

The Section lay downs that the opinions upon a point of technique, science, art, etc.⁶⁹ The section is not exhaustive.⁷⁰ Forensic evidence fall in the category of “science” experts. The word ‘science’ in section 45 of the Indian Evidence Act is used in a comprehensive manner and shall be construed broadly. The acid test for determining whether a particular subject under the category of science is, “whether the subject matter of enquiry is such that

⁶⁵ RICHARD GLOVER & PETER MURPHY, MURPHY ON EVIDENCE 31 (13th ed., 2013).

⁶⁶ AIR 2010 SC 2933.

⁶⁷ MALIK A, LAW OF EVIDENCE 393 (7th ed., 2017).

⁶⁸ CHOO, ANDREW L-T, EVIDENCE, OXFORD UNIVERSITY PRESS 4 (2nd ed., 2009).

⁶⁹ RATANLAL RANCHHODDAS AND DHIRAJLAL KESHAVLAL THAKORE, THE LAW OF EVIDENCE 750 (23rd ed. 2010).

⁷⁰ Sati M, *Evidentiary Value of Forensic Report in Indian Courts*, SCHOLARTICLES (Feb. 11, 2016), <https://scholarticles.wordpress.com/2016/02/11/ms1/> (last visited May 7, 2021).

inexperienced men are unlikely to prove capable of forming a correct judgment upon it without the assistance of expert?”⁷¹ Section 46 of the Indian Evidence Act, says:

Facts bearing upon opinions of experts - Facts not otherwise relevant, are relevant if they support or are inconsistent with the opinions of experts, when such opinions are relevant.

Together, these two sections of the Indian Evidence Act, bring to light certain very crucial elements of the legal system, i.e. faith and trust that law has placed on experts.⁷² Similar provisions exist in other legislations as well. It enables the judicial tribunal to take help from experts possessing special knowledge in certain situations. Likewise, National Green Tribunal Act, 2010 is a good example. As per the Act, the tribunal under the Act shall, along with other judicial members, consist of an environmental expert.⁷³

Given the vast expansion of areas of expertise, no human can be expected to have the capacity to master all field and be a “Renaissance person.” A judge needs help from experts as and when the need arises.⁷⁴ The term "expert" in general, means a person who has special skills or knowledge in a field.⁷⁵ There are experts in wide range of professions and have wide variety of skills, training and education.⁷⁶ The people who give specialised opinion in courts u/s 45 of the Indian Evidence Act are called experts.⁷⁷ Experts are considered as someone who would assist the court in finding out the truth.⁷⁸ An expert is the one who has special skills in a special branch of learning, beyond the range of common knowledge. It is not necessary that a person shall have academic qualifications and degree in order to be an expert. Possessing required expertise in important.⁷⁹ For example, section 47 of the Indian Evidence Act provides that the evidence of a person

⁷¹ RATANLAL RANCHHODDAS AND DHIRAJLAL KESHAVLAL THAKORE, THE LAW OF EVIDENCE 759 (23rd ed. 2010); *Ramesh Chandra v. Regency Hospital*, (2009) 9 SCC 709.

⁷² Sati M, *Evidentiary Value of Forensic Report in Indian Courts*, SCHOLARTICLES (Feb. 11, 2016), <https://scholarticles.wordpress.com/2016/02/11/ms1/> (last visited May 7, 2021).

⁷³ National Green Tribunal Act, 2010, Section 4(1)(c).

⁷⁴ Sangero, B., *Safety from Flawed Forensic Sciences Evidence*, 34 Ga. St. UL Rev. 1136 (2017).

⁷⁵ WEBSTER'S NEW COLLEGIATE DICTIONARY (9th ed. 1991).

⁷⁶ Kapsa, Marilee M. and Meyer, Carl B, *Scientific Experts: Making Their Testimony More Reliable*, 35 California Western L. Rev. 315 (1999) <http://scholarlycommons.law.cwsl.edu/cwlr/vol35/iss2/5>.

⁷⁷ Indian Evidence Act, 1872, Section 45.

⁷⁸ Oren Perez, *Judicial Strategies for Reviewing Conflicting Expert Evidence: Biases, Heuristics, and Higher-Order Evidence*, 64 Am. J. Comp. L. 75,83 (2016).

⁷⁹ Sati M, *Evidentiary Value of Forensic Report in Indian Courts*, SCHOLARTICLES (Feb. 11, 2016), <https://scholarticles.wordpress.com/2016/02/11/ms1/> (last visited May 7, 2021) p 1.

who is not professionally trained in handwriting is admissible provided he is familiar with the handwriting of the other person. Thus, interestingly, it is to be seen whether a person is an expert in a specialised area of knowledge or not.⁸⁰

The conditions that govern the admissibility of expert evidence have been categorically laid by Supreme Court in *Ramesh Chandra v. Regency Hospital*.⁸¹ The conditions are:

1. The expert must be called to court to testify unless section 293 of Criminal Procedure Code⁸² applies. This section provides that senior government experts need not be summoned by the court. The testimony or report of such government experts may be admitted into evidence without calling them to the court. Also, in certain situations foreign experts are allowed to testify through videoconferencing;⁸³
2. The field of expertise shall be a recognised one;
3. Reliability of the report;
4. The expert must be qualified in the area of specialisation.\

*Phipson*⁸⁴ also reiterates the above-mentioned conditions of admissibility. He asserts that the test of admissibility, as also mention in *R v. Bonython*,⁸⁵ is that judges have to decide the two questions -

1. Whether the subject matter of expert opinion is permissible. This can be sub-divided in the two following sub-questions -
 - a. Whether a lay person can form a sound opinion on the subject without assistance from an expert;
 - b. Whether the subject matter falls in the category of organised and reliable body of knowledge;

⁸⁰ RATANLAL RANCHHODDAS AND DHIRAJLAL KESHAVLAL THAKORE, THE LAW OF EVIDENCE 752 (23rd ed. 2010).

⁸¹ (2009) 9 SCC 709.

⁸² The Code of Criminal Procedure, 1973, Act no. 2 of 1974.

⁸³ *Malay Kumar Ganguly v. Dr.Sukumar Mukherjee*, (2009) 9 SCC 221.

⁸⁴ PHIPSON, S.L., BUZZARD, J.H. AND HOWARD, M.N., PHIPSON ON EVIDENCE, SWEET & MAXWELL (1982).

⁸⁵ (1984) 38 SASR 45, South Australia Supreme Court.

2. Whether the expert has attained sufficient expertise by way of study or experience.

Phipson also notes that acquiring knowledge by way of only experience is no disqualification and goes merely to weight of the evidence and not its admissibility. Further, the authority of an expert is limited to presenting his opinion in the court. He shall not act as a judge.⁸⁶ It is for the judge solely to form his own independent judgment with respect to the expert evidence.⁸⁷ Before admitting expert evidence in courts, a judge shall examine the methodologies adopted by the expert and not just the results so that its reliability can be tested.⁸⁸

As regards weight of forensic evidence, it has been held that these are evidence of advisory/secondary nature.⁸⁹ The courts, mostly, insist on corroboration of such evidence as a matter of caution and prudence. Though it is only a general practice and there is no such rule of law.⁹⁰ It is a rule of caution and prudence.⁹¹ Weight of the evidence is dependent on the correctness of the report, the reasoning,⁹² exactness of the technique⁹³ and the expertise.⁹⁴ Example, footprint⁹⁵ and tracker dog evidence⁹⁶ are not backed by reliable scientific principles. The expert report without data in support is inadmissible.⁹⁷ An expert opinion loses its evidentiary value if he does not produce basis/authorities that support his testimony.⁹⁸

Expert opinion are admissible despite being opinion evidences.⁹⁹ An expert is not a witness to facts. Expert evidence has been made admissible out of necessity.¹⁰⁰ It does not go in evidence automatically without proof. Though there are some statutory exceptions like

⁸⁶ *Ibid.*

⁸⁷ *Titli v. Jones*, AIR 1934 All 237.

⁸⁸ Sangero, B., *Safety from Flawed Forensic Sciences Evidence*, 34 Ga. St. UL Rev. 1129,1136 (2017).

⁸⁹ *State of Himachal Pradesh vs. Jai Lal and Ors.*, MANU/SC/0557/1999.

⁹⁰ RATANLAL RANCHHODDAS AND DHIRAJLAL KESHAVLAL THAKORE, THE LAW OF EVIDENCE 757 (23rd ed. 2010); *Murali Lal v. State of M.P.*, AIR1980SC531.

⁹¹ *Parappa and Ors. vs. Bhimappa and Ors.*, MANU/KA/0059/2008.

⁹² *Malay Kumar Ganguly v. Dr.Sukumar Mukherjee*, (2009) 9 SCC 221.

⁹³ Agarwal, A. and Gangopadhyay, P., *Use of Modern Scientific Tests in Investigation and Evidence: Mere Desperation or Justifiable in Public Interest*, NUJS L. Rev., 2,31(2009).

⁹⁴ *Parappa v. Bhimappa*, 2008 AIHC 2777, 2783 (Kant HC).

⁹⁵ *Pritam Singh v. State of Punjab*, AIR1956SC415.

⁹⁶ *Abdul Rajak Murtaza Dafedar v. State of Maharastra*, AIR1970SC283.

⁹⁷ *Ramesh Chandra Agrawal vs. Regency Hospital Ltd. and Ors.*, MANU/SC/1641/2009.

⁹⁸ Dalal, A.S. & Mukherjee, Arunava, *Constitutional and Evidentiary Validity of New Scientific Tests*, JLI 49 (2007).

⁹⁹ *Id.* at 313.

¹⁰⁰ MONIR M., THE LAW OF EVIDENCE, UNIVERSAL LAW PUBLICATION 233 (10th ed., 2015).

Section 509 Cr.P.C.¹⁰¹ (Medical Certificate) and Section 510 Cr.P.C.¹⁰² (Report of Chemical analyst) etc. In general, it is essential to check the reliability or ground on which such opinion is based. This is a specific requirement of admissibility of expert evidence.¹⁰³ And, it is provided in Section 51 of the Evidence Act as well. The section says that “whenever the opinion of any living person is relevant, the grounds on which such opinion is based are also relevant.”

This theoretical and conceptual background shall provide a basis for evaluation of evidentiary regime in India. These are the rules and legal precedents that together lay down the foundation for application of forensic science in courts.

1.3 GATEKEEPING FUNCTION OF COURTS

The parties to a litigation decide the presentation of expert evidence in court.¹⁰⁴ Yet, it is for the presiding judge to evaluate all evidence in a manner that the truth comes to the surface.¹⁰⁵ The discretion and authority to examine the veracity and admissibility of expert evidence lies with the presiding judge.¹⁰⁶ This is referred to as the gatekeeping function of a judge. *Mara and others* have defined gatekeeping in clear and categorical terms as “judicial responsibility for ensuring that evidence heard by trier of facts adheres to the admissibility standards of the jurisdiction in which the case is heard.”¹⁰⁷ A fine illustration of execution of gatekeeping function was observed in the case of *Anish Rai v. State of Sikkim*.¹⁰⁸ The High Court of Sikkim in the case refused to accept the expert opinion for want of reliable basis and reasoning in the expert report.¹⁰⁹ In this case an expert gave evidence regarding the age of a person using x-ray method. The court remarked that X-ray certainly gives information about the stage of fusion of the bone in the body of a person but this much information in itself is not enough for the court to reach any conclusion. The court held that the expert “ought to have clarified and elaborated on what the various stages of fusion of bone signified and how consequently she has reached her finding of the bone

¹⁰¹ The Code of Criminal Procedure, 1973, Act no. 2 of 1974.

¹⁰² *Ibid.*

¹⁰³ *Ramesh Chandra Agrawal vs. Regency Hospital Ltd. and Ors*, MANU/SC/1641/2009.

¹⁰⁴ *State of Uttarakhand v. Akhtar Ali*, MANU/UC/0918/2019.

¹⁰⁵ *Ibid.*

¹⁰⁶ Sati M, *Evidentiary Value of Forensic Report in Indian Courts*, SCHOLARTICLES (Feb. 11, 2016), <https://scholarticles.wordpress.com/2016/02/11/ms1/> (last visited May 7, 2021) p 5.

¹⁰⁷ Mara L. Merlino, Colleen I. Murray & James T. Richardson, *Judicial gatekeeping and the social construction of the admissibility of expert testimony*, 26 BEHAV. Sci. & L. 187,188 (2008).

¹⁰⁸ *Anish Rai v. State of Sikkim*, 2018 SCC OnLine Sikk 141.

¹⁰⁹ *Id.* para 15.

age of the victim to enable the court to reach a decision with clarity and to appreciate her efforts.”¹¹⁰ The powers given to a trial judge under section 165 of the Evidence Act, 1872 are wide enough to include screening of expert evidence for reliability and relevancy.¹¹¹ The section requires a judge to be proactively involved in expert examination and not act as a moot spectator.¹¹²

Forensic evidence, unlike ocular evidence, are considered as demonstrative in nature i.e. they are based on some technique, theorem, empirical data, method etc.¹¹³ For instance, in case of fingerprint evidence, ACE-V is the technique used. Such principles/techniques on which the forensic evidence are based should be shown to be trustworthy by the expert testifying in court. Reliability of expert evidence is a requirement that other types of evidence like eye witnesses etc., are not required to meet. Some of the possible reasons for this are:¹¹⁴

- Expert evidence are purported as scientific and are an exception to the rule against opinion evidence;
- Expert evidence can unduly influence the minds of judges making them overvalue the weight of such evidence;
- It is practical to examine reliability of such evidence.

Reliability means the quality of “repeatability, reproducibility, and accuracy.”¹¹⁵ “Reliability” refers to the quality of something being consistent. For example, a method will be called reliable if it leads to same result even when performed by different people at different times.¹¹⁶ It is different from validity. Validity refers to the suitability of the method for the purpose for which it is employed.¹¹⁷ A technique can be reliable though not valid. For instance, a test that employs skin colour for deciding one’s culpability would yield same result all the time, as everyone would concur in respect of the colour of the

¹¹⁰ *Id.* para 15.

¹¹¹ *State of Uttarakhand and Ors. vs. Akhtar Ali and Ors.* MANU/UC/0918/2019.

¹¹² *Ibid.*

¹¹³ *Dayal Singh v. State of Uttaranchal*, (2012) 8 SCC 263.

¹¹⁴ Sangero, B., *Safety from Flawed Forensic Sciences Evidence*, 34 Ga. St. UL Rev. 1129,1135 (2017).

¹¹⁵ PRESIDENT’S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*, EXECUTIVE OFFICE OF PRESIDENT 47 (Sep. 2016).

¹¹⁶ Sandy A. Zabell, *Fingerprint Evidence*, 13 J.L. & POL’Y 143,154 (2005).

¹¹⁷ Arshad, H., Jantan, A. B., & Abiodun, O. I., *Digital Forensics: Review of Issues in Scientific Validation of Digital Evidence*, 14(2) J. OF INFO. PROCESSING SYSTEMS 348 (2018).

accused. And, thus it would be a reliable method. But it would not be correct way of deciding the guilt and therefore would not be valid. In contrast, the idea of validity presupposes reliability. This means that a test can never be valid if it is not reliable. Scientific validity, as opposed to mere validity, means that a method is shown to be reliable based on empirical study.¹¹⁸

It is thus evident that the credibility of the forensic scientific evidence always depends on the reliability of the forensic test/examination. Forensic evidence presented in the courts as evidence shall pass the test of reliability. The courts have to be alert and highly careful in placing reliance on it. This, however, poses a great difficulty to the judges.¹¹⁹ Judges are required to act proactively while dealing with questions of reliability of forensic evidence. The lawyers though have an interest in reification of science to support their case, their interest in the outcome of the case makes them inevitably manipulate the scientists.¹²⁰ This is where the gatekeeping function of the courts comes into play. The role of the trial judge is not limited to deciding whether the expert testimony is relevant but extends to deciding whether the science/technique that lays at the foundation of the testimony is reliable.¹²¹ One of the motives behind giving this responsibility to judges is to reduce intrusion of scientists outside the courtroom from directly influencing outcome of a litigation.¹²²

This is a very crucial role of trial judges. After all, trial is nothing but search for truth and the trial court shall play a very crucial role in eliciting the truth.¹²³ An opinion of an expert is just an opinion and the court is free to not accept it. Experts can no longer be presumed to be objective in their findings.¹²⁴ Because they are paid for their services by a party, experts are more likely to depose in the favour of the party paying them. The concern

¹¹⁸ PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*, EXECUTIVE OFFICE OF PRESIDENT 48 (Sep. 2016).

¹¹⁹ C.E.Pratap, *Probative Efficacy of Forensic Scientific Techniques in Criminal Trials*, ACADEMIA (last visited Nov. 25, 2019).

¹²⁰ Jenny McEwan, Carol A. Jones, *Expert Witnesses: Science, Medicine, and the Practice of Law*, 4 Soc. & Legal Stud., 552 (1995).

¹²¹ CHRISTOPHER MUELLER & LAIRD KIRKPATRICK, EVIDENCE 7,8 (1995).

¹²² Gary Edmond, *Science, Law and Narrative: Helping the Facts to Speak for Themselves*, 23 S. ILL. U. L. J. 555 (1999).

¹²³ *State of Uttarakhand v. Akhtar Ali*, MANU/UC/0918/2019.

¹²⁴ Jennifer L. Mnookin, *Expert Evidence, Partisanship, and Epistemic Competence*, 73 Brook. L. Rev. 1010 (2008).

regarding partisan nature of experts has been shared by judges as well.¹²⁵ The court has to proactively satisfy itself of the reasoning behind the opinion.¹²⁶ In other words, the judge shall form an independent opinion as to the accuracy of the conclusions drawn by the expert based on his testimony.¹²⁷ Whenever law makes an expert opinion part of the decisions, it does it at its own risk.¹²⁸ This is particularly why there is special difficulty in dealing with evidence of expert witnesses. Such evidence have to be received with great caution and care.¹²⁹ Especially because an opinion of expert once accepted becomes the opinion of the court.¹³⁰

1.4 DAUBERT STANDARD

Recognising that there exists a gap in legislative framework on the issue of admissibility of forensic evidence, the judiciary whenever faced with such situation has taken help of law from other jurisdictions. The courts in India have been referring to *Daubert*¹³¹ standards when the question of evaluating forensic evidence has arisen before court.¹³² For instance, in relation to testing the validity of polygraph test, the Supreme Court in the famous case of *Selvi v. State of Karnataka*¹³³ referred to *Daubert* Standards.

The United States (US) Supreme Court in the revolutionary case of *Daubert v. Merrell Dow Pharmaceuticals, Inc*¹³⁴ placed on the trial courts the role of “gatekeepers”. The judgment tasked the judges with the responsibility of scrutinising the science coming to the court.¹³⁵ Factually the case involved claim of damages caused by the use of a drug called ‘benedectin’ which was being prescribed for “morning sickness” during pregnancy. The issue involved in the case was whether use of this drug led to birth defects in new-

¹²⁵ *CBI v. Subhash Chandra*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/79982667/> (last visited May 31, 2022), para 172; *Sh. Dev Prakash v. Smt. Usha Sethi*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/70026842/> (last visited May 31, 2022), para 8.

¹²⁶ *Sushil Sharma S/o Late Kharananda Sharma v State of Sikkim*, 2018 Indlaw SIK 93.

¹²⁷ *State of Himachal Pradesh vs. Jai Lal and Ors.*, MANU/SC/0557/1999.

¹²⁸ Onstott, C., *Judicial Notice and the Law's Scientific Search for Truth*, 40 Akron L. Rev. 465 (2007).

¹²⁹ SARKAR, LAW OF EVIDENCE 1052 (16th ed. 2007).

¹³⁰ *Madan Gopal Kakkad vs. Naval Dubey and Ors.*, MANU/SC/0509/1992.

¹³¹ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

¹³² *Mukesh and another Vs. State (NCT of Delhi) and others*, (2017) 6 SCC 1; *Dharam Dev Yadav v. State of UP*, 2014 (86) ACC 293 (SC); *Harjinder Kaur v. State of Punjab*, 2013(2) RCR (Criminal)146 (P&H HC); *Rajli v. Kapoor Singh*, (2014)174(2) PLR575 (P&H HC).

¹³³ AIR2010SC1974.

¹³⁴ 509 U.S. 579 (1993).

¹³⁵ Hilbert, J., *The Disappointing History of Science in the Courtroom: Frye, Daubert, and the Ongoing Crisis of Junk Science in Criminal Trials*, Okla. L. Rev., 71,759 (2018).

borns. In order to reach a conclusion, the US Supreme Court identified four non-definitive parameters for testing reliability of an expert opinion. They are –

- i. Testability or falsifiability,
- ii. Peer review,
- iii. Known or potential error rate, and
- iv. General acceptance within the scientific community.

The court gave these factors by way of illustration and prescribed a flexible enquiry into the matter. Essentially, as per *Daubert* the trial court is responsible for “assessment of whether the reasoning or scientific methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.”¹³⁶ It means judges shall search out the reliability of the technique themselves.¹³⁷

The first criteria, is based on Karl Popper’s principle of falsifiability, which means that the technique in question shall be empirically testable. The second *Daubert* factor is peer review. It refers to evaluation of the quality of the research by peers and contemporaries.¹³⁸ The rate of error is indicative of the accuracy and the likelihood of the flawed results of the expert’s methods.¹³⁹ The last of the four factors is general acceptance. It relates to consensus among the scientists.¹⁴⁰

Daubert judgment along with the two other landmark cases have come to be known as *Daubert* trilogy. The other two cases are *Joiner* and *Kumho*. In *General Electronic Co. v. Joiner*,¹⁴¹ a 37-year-old plaintiff alleged that exposure to a chemical led to cancer in his body. On the basis of *Daubert*, the trial court did not consider the plaintiff’s expert testimony as the court found that the expert testimony was merely speculative and, therefore inadmissible. The intermediate appellate court applied stringent standards of review of the trial court decision on expert evidence and

¹³⁶ 509 U.S. at 592-593, 113 S.Ct. at 2796.

¹³⁷ Boaz Sangero & Mordechai Halpert, *Scientific Evidence v. “Junk Science,”* 11 C.L.B. L. STUD. 431 (2014) (Isr.).

¹³⁸ Kevin D. Hill, *The Crisis in Scientific Publishing and its Effect on the Admissibility of Technical and Scientific Evidence*, 49 J. Marshall L. Rev. 727,732 (2016).

¹³⁹ Meixner, John B., and Shari Seidman Diamond, *The hidden Daubert factor: How judges use error rates in assessing scientific evidence*, Wis. L. Rev. 1063,1067 (2014).

¹⁴⁰ Faigman, David L., John Monahan, and Christopher Slobogin, *Group to individual (G2i) inference in scientific expert testimony*, The University of Chicago L. R. 417,460 (2014).

¹⁴¹ *General Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997).

reversed the findings.¹⁴² The court of appeals held that the review standards were changed by *Daubert*.¹⁴³ Later, the Supreme Court held that the standards of review by appellate court have not changed after *Daubert*. The proper standard for review of evidentiary decisions by a trial court, traditionally, has been the abuse of discretion and continues to remain the same.¹⁴⁴

In the other case, i.e., *Kumho Tire co. v. Carmichael*,¹⁴⁵ it was held that *Daubert* is meant for both scientific testimonies and technical ones. The case involved testimony of expert regarding manufacturing and defects of tyres. The trial court rejected the testimony for want of reliability as per the *Daubert* standards.¹⁴⁶ The Circuit court reversed the trial court's evidentiary findings holding that *Daubert* standards apply only to the scientific testimonies and not skill or experience-based testimonies.¹⁴⁷ The Supreme Court of the US clarified that application of *Daubert* standards was not limited to scientific testimonies only. It covers all those areas of scientific knowledge.¹⁴⁸

Following *Daubert*, amendment was introduced in the US Federal Rule of Evidence in the year 2000. Rule 702. It now states that -

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

¹⁴²*Id.* at 140.

¹⁴³*Id.* at 142.

¹⁴⁴*Id.* at 141.

¹⁴⁵*Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167 (1999).

¹⁴⁶*Id.* at 2.

¹⁴⁷*Ibid.*

¹⁴⁸*Ibid.*

Prior to 2000 amendment, clause (b), (c) and (d) were not part of the rule 702. These clauses were borrowed from *Daubert* and incorporated in the rule. The commentary¹⁴⁹ accompanying the revised rule elucidates factors other than the ones specifically mentioned in *Daubert*. These are: whether the research relating to expert evidence has been done independent of the case or whether it was carried out solely for the purpose of the litigation; whether there is extrapolation of research findings; whether other possible results and explanations have been accounted for; whether the amount of care exercised by the expert for the purpose of the litigation is the same as he could exercise otherwise; whether the expert testimony related to a reliable field of knowledge.¹⁵⁰

It is not possible to find one uniform set of standards that would apply to all sciences as each of the technique/method of scientific enquiry is at difference stage of sophistication; each has its own tools, assumptions, methodologies, goals etc.¹⁵¹ For example, there is vast difference between clinical physicians and physicians involved in research.¹⁵² For the clinical physicians the goal is to avail patients with medicines.¹⁵³ And for the research oriented physicians the goal is to conduct trial and check the efficacy of new medicines.¹⁵⁴ Each of forensic technique/method has its own methodology. Moreover, each is different in the level and degree of their scientific development.¹⁵⁵

The Commentary makes it clear that there cannot a particular set of factors applicable to all expert evidence. Different methods/techniques are evaluated differently as per the methodology involved. The degree of scrutiny for expert that are not scientist shall be the same as that of experts that are scientists. Some type of expert testimonies are verifiable objectively and some are not. Irrespective of the area of expertise, the more important issue is to determine whether testimony is “grounded in an accepted body of learning or

¹⁴⁹CORNELL LAW SCHOOL,
https://www.law.cornell.edu/rules/fre/rule_702#:~:text=The%20amendment%20makes%20clear%20that,relability%20of%20the%20expert's%20opinion. (last visited May 7, 2021).

¹⁵⁰ Bigenwald, A. and Chambon, V., *Criminal responsibility and neuroscience: no revolution yet*, *Frontiers in psychology* 10 (2019).

¹⁵¹ Kapsa, Marilee M. and Meyer, Carl B, *Scientific Experts: Making Their Testimony More Reliable*, 35(2) *California Western L. Rev.* 317,321 (1999).

¹⁵² *Id.* at 321.

¹⁵³ *Id.* at 321.

¹⁵⁴ *Id.* at 321.

¹⁵⁵ COMMITTEE ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIENCES COMMUNITY, NATIONAL ACADEMY OF SCIENCES, *STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD*, NATIONAL RESEARCH COUNCIL 111 (2009).

experience in the expert's field, and the expert must explain how the conclusion is so grounded.”¹⁵⁶

1.5 LITERATURE REVIEW

As much as forensic science aids in the dispensation of justice, it presents the judges with challenges that are unique in nature.¹⁵⁷ The following real-life incident would aptly put context around the issue this study revolves around. Having spent 22 years in jail and followed by parole as a sex offender for 9 year on charges of rape and murder, a young man from District of Columbia, Mr. Kirk Odom, was found to be innocent in the year 2012 and was exonerated with the help of DNA testing.¹⁵⁸ The reason for 31 years long unjustified suffering borne by an innocent man and his family was an improper hair analysis report.¹⁵⁹ The hair analyst in this case claimed that the hair found on the victim's gown was microscopically similar to Odom's hair “meaning that the samples were indistinguishable”¹⁶⁰ and that he had seen such similarity only “eight or 10 times in the past 10 years, while performing thousands of analyses.”¹⁶¹ These were highly exaggerated claims especially as the hair microscopy has not been proved to be an exact science and has not developed to the extent that it can yield an indistinguishable “match”.¹⁶² The case very aptly shows how judges could fall prey to such exaggerated testimonies. There are numerous such documented cases of wrongful decisions.¹⁶³ A significant number of DNA exonerations cases are attributable to wrongful application of forensic evidence. In some cases, scientific evidence is found unreliable because the foundational science is unreliable while in some instances, forensic evidence is mis-stated or inaccurately presented in courts.¹⁶⁴

¹⁵⁶ CORNELL LAW SCHOOL https://www.law.cornell.edu/rules/fre/rule_702 (last visited May 7, 2021).

¹⁵⁷ Cynthia H. Cwik, *Guarding the Gate: Expert Evidence Admissibility*, 25 Litig. 6 (1999).

¹⁵⁸ *Kirk Odom*, Innocent Project, <https://www.innocenceproject.org/cases/kirk-odom/> (last visited May 7, 2021).

¹⁵⁹ *Kirk Odom*, INNOCENT PROJECT <https://www.innocenceproject.org/cases/kirk-odom/> (last visited May 7, 2021).

¹⁶⁰ *Ibid.*

¹⁶¹ *Ibid.*

¹⁶² *Ibid.*

¹⁶³ *Commonwealth v. Cowans*, 756 N.E.2d 622 (Mass. App. Ct. 2001); *The Chamberlains case*, Shirley Mckei, Kevin Callan (2000) etc; <https://innocenceproject.org/all-cases/#unvalidated-or-improper-forensic-science>.

¹⁶⁴ Kapsa, Marilee M. and Meyer, Carl B, *Scientific Experts: Making Their Testimony More Reliable*, 35(2) CALIFORNIA WESTERN L. REV. Article 5, 331(1999).

The evolution of forensic science is now at the juncture where its effectiveness, reliability and probative worth is being critically analysed and challenged. Unchallenged acceptance of the scientific findings and blind deference to the scientific conclusions is being questioned. Jurisprudentially, this could be seen as a shift of emphasis from material evidence to human evidence.¹⁶⁵ The critical reflection of forensic is, in part, result of the Innocent Project.¹⁶⁶ The project has been instrumental in highlighting structural and procedural deficiencies in the use of forensics as evidence. The project works for exoneration of people wrongfully convicted for various reasons. Alarming, it was found that the second highest cause for wrongful conviction or 53% of the wrongfully decided cases were the result of misapplication of forensic sciences.¹⁶⁷ Numerous instances of admission of untrustworthy evidence and, resultant, wrongful judicial decisions have also shaken the trust over forensics.¹⁶⁸ Congress (U.S.) delegated the task of assessing the forensic science in United States to National Academy of Sciences. The body took two years to study and prepare a comprehensive report on the subject. The final report was made public in the year 2009.¹⁶⁹ It received a mixed response from stakeholders. But it certainly was an eyeopener. The Academy found serious flaws in the foundation of certain forensic disciplines. It made a categorical remark that judges have been ineffective in filtering out the unreliable forensic evidence from the courtrooms. The same findings were reiterated in the year 2016 in a report by President's Council of Advisors on Science and Technology (PCAST).¹⁷⁰ The report mentioned that none of the forensic disciplines, except DNA, can claim to be perfectly reliable. Further, it clarified that reliability has two dimensions. One is reliability in process and the other is reliability in application.

¹⁶⁵ Weizman E., *The least of all possible evils: humanitarian violence from Arendt to Gaza*. London, UK: Verso 105 (2011).

¹⁶⁶ INNOCENCE PROJECT, <https://innocenceproject.org> (last visited Jan. 14th, 2024).

¹⁶⁷ INNOCENCE PROJECT, <https://innocenceproject.org/the-issues/> (last visited Jan. 14th, 2024).

¹⁶⁸ *R v Atkins and Atkins*, [2009] EWCA Crim 1876; *R v. Stockwell*, (1993) 97 Cr App R 260; *R. v. Reed, Reed and Garmson*, [2009] EWCA Crim 2698.

¹⁶⁹ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, NATIONAL RESEARCH COUNCIL (2009).

¹⁷⁰ Report to the President, *Forensic science in criminal courts: ensuring scientific validity of Feature Comparison Methods*, 1 (Sep, 2016).

O'Brien & others has thrown light on three key areas that demand attention both from legal and science practitioners.¹⁷¹ They are admissibility of expert evidence, reliability factor, and rapport between the expert and the jury.¹⁷² Lack of scientific knowledge among adjudicators is one of the biggest hurdles in admission or exclusion of evidence that lack required standard of reliability or probity. Issues, such as exaggerated expert opinion, unscientific basis of the expert opinion, lack of reliability test/standards, biasness among private experts, have led to undermining the reliability of many forensic techniques.¹⁷³ The likelihood-ratio approach for evaluation of expert evidence has to some extent addressed these issues. In case of soft-sciences, such as footwear mark, fingerprint analysis, the foundation basis of the techniques is weak. The expert testimony based on such techniques is not accurate and is susceptible to misapplication. Gait analysis, facial mapping, footmark identification, etc lack clearly established standards or comparable database. The admission of forensic evidence based on such techniques is questionable. Though, in practice, it is observed that such techniques are admitted in courts as corroborative evidence that lend some assistance to the judge.¹⁷⁴ Further, the issues of contradictory expert opinion are decided on the basis of exogenous factors including qualification, experience, reputation, etc. These factors are nowhere related to scientific worth of an expert testimony and are not reflective of their correctness. Unsafe and unregulated admission of forensic evidence has the potential to corrode the judicial system and demolish the faith people have in this institution.¹⁷⁵ Right to fair trial demands that forensic science shall be employed to make the justice delivery system more effective, not to weaken it.¹⁷⁶

A Law Commission report, titled *Expert evidence in Criminal Proceedings in England and Wales*,¹⁷⁷ also took into consideration various judicial decisions and instances of

¹⁷¹ O'Brien, É., Nic Daeid, N. and Black, S., *Science in the court: pitfalls, challenges and solutions*, PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B: BIOLOGICAL SCIENCES, 370 (2015).

¹⁷² *Ibid.*

¹⁷³ *Id.* at 373.

¹⁷⁴ *Id.* at 373.

¹⁷⁵ *Id.* at 375.

¹⁷⁶ *Ibid.*

¹⁷⁷ Law Commission, *EXPERT EVIDENCE IN CRIMINAL PROCEEDINGS IN ENGLAND AND WALES*, Law Com. No 325 (21 March 2011) lawcommission.justice.gov.uk/areas/expert-evidence-in-criminaltrials.htm (accessed on 30/10/2012).

misapplication of forensic evidence.¹⁷⁸ The report concluded that the standards of admission of expert evidence in common law nations is not satisfactory and does not act as a guard against unreliable expert evidence. It was also noted that science and law are two distinct subjects. This makes judicial decisions makers vulnerable to making errors while assessing reliability of forensic evidence. Jurors trend to focus on factors, such as demeanour and professional status of an expert, that are not accurate pointers to reliability. The report suggests introduction of stricter standard of admissibility with respect of expert evidence.

Paul Roberts asserts that forensic science plays a crucial role in the investigation and prosecution of offenders, but there have been notorious miscarriages of justice due to over-reliance on apparently powerful scientific evidence.¹⁷⁹ The decision to seek scientific assistance is usually taken by the police, with some involvement from law clerks, solicitors, and prosecution counsel. Judges and magistrates decide which individuals claiming forensic science expertise are competent to appear as expert witnesses. The author has described various stages of production and admission of forensic evidence. It was emphasised that courtroom plays shall be fully cognisant of the limitations associated with a particular forensic discipline. This would ensure an error free assessment of its probative worth.

Eileen Gay Jones has tried to answer the unanswerable question, i.e., how do we know that a study is scientific.¹⁸⁰ This dilemma is faced by litigants trying to prove their claim based on expert evidence and not being able to prove the scientificity of the evidence. The decision with respect to reliability are taken by judges. At the same time, a significant role may be play by lawyers by revealing pertinent facts before the court. Good lawyering has the potential to keep the unscientific evidence away from court. Further, with the help of

¹⁷⁸ *R v Dallagher* [2002] EWCA Crim 1903; *R v. Clark* [2003] EWCA Crim 1020; *R v. Cannings* [2004] EWCA Crim 1; *R v. Harris and others* [2005] EWCA Crim 1980.

¹⁷⁹ Paul Roberts, *Science in the Criminal Process*, 14 OXFORD J. LEGAL Stud. 469 (1994).

¹⁸⁰ Eileen Gay Jones, *Gatekeeping Soothsayers, Quacks and Magicians: Defining Science in the Courtroom - Judging Science: Scientific Knowledge and the Federal Courts*, 25 WM. MITCHELL L. REV. 315 (1999).

case laws, it was shown that judges have applied *Daubert* standards to exclude unreliable testimonies.¹⁸¹

Stern has reiterated the concerns arising as a result of wrongful conviction.¹⁸² A reference is made to the case of Keith Harward, who was wrongfully convicted on the basis of bitemark comparison. *Stern* argues that the term reliability is potentially confusing and vague. He contends that legal reliability shall match with scientific reliability. *M. Chris Fabricant* has undertaken a study of two specific forensic techniques and the instances of wrongful conviction associated with them. The two forensic techniques are forensic odontology and forensic hair microscopy.¹⁸³ *Chris* by way of this studies is pointing towards a paradigm shift in forensics. The perception relating to infallibility and accuracy of the forensic evidence is fading away. The closer and stricter scrutiny of science based evidence is being demanded in the wake of wrongful conviction and reports from seminal bodies such NAS.

J. Mnookin et. al. also touches upon the debatable aspects of forensic disciplines. He explains that fundamental basis, claims, assumptions and dearth of scientific study of techniques involving feature comparison are the focal point of the criticism raised by scholars worldwide. The author suggests that the sanctity lost by forensics can be regained by developing a culture of scientific research. This would in turn provide forensics a foundational basis for reclaiming its lost status and respect in courtroom. *Myrna S. Raeder* also emphasises on serious need for study of causes of wrongful convictions.¹⁸⁴ A slew of measures have been undertaken at the behest of the American Bar Association to study the causes of wrongful convictions. It was found that astute advocacy is one efficient way of saving the justice system from this menace.

¹⁸¹ Eileen Gay Jones, Gatekeeping Soothsayers, *Quacks and Magicians: Defining Science in the Courtroom - Judging Science: Scientific Knowledge and the Federal Courts*, 25 WM. MITCHELL L. REV. 315, 326 (1999).

¹⁸² Stern, H.S., Cuellar, M. and Kaye, D., *Reliability and validity of forensic science evidence*, 16(2) Significance 21 (2019).

¹⁸³ M.C. Fabricant and T. Carrington, *The Shifted Paradigm: Forensic Science's Overdue Evolution from Magic to Law*, 4 Virginia Journal of Criminal Law 1 (2016).

¹⁸⁴ Myrna S. Raeder; Andrew E. Taslitz; Paul C. Giannelli, *Convicting the Guilty, Acquitting the Innocent - Recently Adopted ABA Policies*, 20 Crim. Just. 14 (2006).

Sarah Lucy Cooper talks about the procedural hurdles faced by litigants when a review of judicial decision is sought in light of the change in scientific knowledge.¹⁸⁵ Science is also undergoing changes and is not static, as is popularly believed. The techniques of forensics that were once considered reliable may at a later stage be discredited. Such shift in scientific knowledge impacts the decision wherein the technique was used as evidence. It has been observed that the legal system is not well-suited to accommodate such change in scientific knowledge. The legal system tends to faithfully stick to principles of procedural law and fails to acknowledge the shifting scientific opinions. The faith in legal system was questioned by *Keith A. Findley* as well.¹⁸⁶ Even empirical evidence pointing out inefficiencies or loose ends in the system have been ignored in the face of judicial adherence to strict principles and rules of procedure.¹⁸⁷ DNA exonerations have been an eye-opener in identifying the flaws in judicial decision making. This should act as a wake up call for the system that heavily relies on traditional procedural safeguards such as jury trial, cross-examination and production of counter evidence.

In Indian context, the amount of attention this issue has gained from scholarly bodies is meagre. There are no rules specifically to deal with forensic evidence. Since forensic evidence are a species of expert evidence, which is a wider term, the rules applicable to expert evidence are applied to forensic evidence as well. *Sadhana* states that the law relating to expert opinion in India is not at all comprehensive and this is why the expert opinion is considered as weak evidence.¹⁸⁸ Disclosure of the basis of the expert opinion has been held to be of utmost importance by way of various judicial pronouncements. Yet, there has been little discussion on how the judge shall evaluate the theory presented to it which may be a complex task for a judge. *Gangopadhyay* holds that the law pertaining to status of scientific tests/techniques for evidentiary purposes is ambiguous.¹⁸⁹ *Gupta* asserts that the judicial system is devoid of legislations to assess forensic evidence involving some

¹⁸⁵ Sarah Lucy Cooper, *Judicial Responses to Shifting Scientific Opinion in Forensic Identification Evidence and Newly Discovered Evidence Claims in the United States: The Influence of Finality and Legal Process Theory*, 4 Brit. J. Am. Legal Stud. 649 (2015).

¹⁸⁶ Keith A. Findley, *Learning from Our Mistakes: A Criminal Justice Commission to Study Wrongful Convictions*, 38 Cal. W. L. Rev. 333 (2002).

¹⁸⁷ *Id.* at 334.

¹⁸⁸ Sadhana.S & K.Roja, *A Study on the admissibility of Expert Evidence in Indian Evidence Act*, 120(5) Int'l J of Pure and Applied Mathematics 1123-1136 (2018) <https://acadpubl.eu/hub/2018-120-5/2/116.pdf> (last visited May 7, 2021).

¹⁸⁹ Agarwal, A. and Gangopadhyay, P., *Use of Modern Scientific Tests in Investigation and Evidence: Mere Desperation or Justifiable in Public Interest*, NUJS L. Rev. 2,31(2009).

complex and scientific technique. It is again and again recommended that appropriate legal provisions with regard to the evaluation of forensic evidence in the Indian Evidence Act should be enacted so that forensic evidence can be used effectively in the courts.¹⁹⁰ The rules of evidence were enacted long time ago, are no more adequate to deal with the demands of this scientific age.¹⁹¹

Kumar holds that in India, the present legal framework is not enough to determine the significant features such as reliability and admissibility of forensic evidence. The sole legal provision present in the Indian Laws is Section 45 of the Indian Evidence Act and that too is very limited in its scope. The section only says that a person may be called an expert of a subject if he is skilled. There are no guidelines for the trial judge to help him in determining some important issues such as reliability and admissibility of forensic evidence.¹⁹²

Gaudet has, with the help of *State of Maharashtra v. Sharma*,¹⁹³ shown how untrustworthy can enter courts if there are no admissibility standards in place.¹⁹⁴ The case involved murder of a woman by poisoning. The court in the case admitted into evidence the results of a controversial brain mapping technique i.e., brain electrical oscillation signature (BEOS). It is asserted that though that piece of evidence was not determinative of the fate of the case, yet the admission of a controversial technique into evidence is indicative of lack of safeguards against unreliable evidence.¹⁹⁵ In India, assessment of expert evidence is restricted to an evaluation of the qualifications of an expert and nothing more.¹⁹⁶

Dinkar asserts that the courts in India in comparison to those in U.S. and U.K. do not have the required confidence to perform the gatekeeping function effectively. It is mainly because the courts are not able to fix the reliability of the forensic evidence to their

¹⁹⁰ Gupta, R., Gupta, S. and Gupta, M., *Journey of DNA Evidence in Legal Arena: An Insight on Its Legal Perspective Worldwide and Highlight on Admissibility in India*, Journal of Forensic Science and Medicine 2(2),102 (2016).

¹⁹¹ REPORT OF THE COMMITTEE ON DRAFT NATIONAL POLICY ON CRIMINAL JUSTICE, MINISTRY OF HOME AFFAIRS (Jul. 2007), p 33.

¹⁹² (1987) 4 SCC (Jour) 7.

¹⁹³ *State of Maharashtra v. Sharma*, C.C., No. 508/07, Pune, June 12, 2008.

¹⁹⁴ Gaudet, L.M., *Brain fingerprinting, scientific evidence, and Daubert: a cautionary lesson from India*, Jurimetrics 293 (2010).

¹⁹⁵ *Ibid.*

¹⁹⁶ Gaudet, L.M., *Brain fingerprinting, scientific evidence, and Daubert: a cautionary lesson from India*, Jurimetrics 293 (2010).

satisfaction. Further, in India there are no guidelines, fixed by law or the Supreme Court, to assist the judges in the task of evaluating scientific evidence.¹⁹⁷

The shyness of courts in dealing with expert witness was acknowledged by Kerala High Court in the case of *Chellappan v. State of Kerala*,¹⁹⁸ in relation to evidence given by an odontologist. To quote, the High Court said that “the court needs to shed its shyness in accepting scientific evidence. The pedantic approach made by the court needs to be replaced by a more rational and practical approach.”¹⁹⁹ The High Court categorically stated that it would be disastrous if the courts are not prepared to evaluate the expert reasoning presented to it as evidence.²⁰⁰

Thus, there is abundant literature to elucidate the need to plug gaps existing in laws and practices relating to forensic evidence and their reliability assessment.

1.6 STATEMENT OF PROBLEM

The literature review has revealed serious issues that call for attention from scholars, academicians and other stakeholders. The twofold major cause of concern are, firstly, unearthing of numerous cases that were wrongfully decided owing to misleading/exaggerated/unreliable forensic evidence/testimony and, secondly, discovery of the shortcomings of certain widely used forensic disciplines such as fingerprints, voice comparison, odontology etc. In essence, conventional image of forensic science as ostensible objective, impartial, and entirely reliable has shattered as deficiency in scientific foundational validity of forensic science disciplines have shot into the limelight. The concerns raised regarding the validity and reliability of certain forensic science disciplines are universally applicable.²⁰¹ These two major events are a testament to the fact that forensic science and the evidence/testimony based on forensic science are not unassailable as is traditionally understood and are susceptible to erroneous results. Unaffected and unperturbed by these latest revelations, the courts have been admitting forensic evidence in a routine manner guided by traditional beliefs that

¹⁹⁷ (1987) 4 SCC (Jour) 7.

¹⁹⁸ Cr. Appeal No. 760 of 2009, decided on 13/09/2012.

¹⁹⁹ *Ibid.*

²⁰⁰ *Ibid.*

²⁰¹ Karen Richmond, *The NAS/NRC Report: Global Perspectives, Ongoing Challenges*, LAW & SCIENCE (Apr. 15, 2019) <https://lawandscienceweb.wordpress.com/> (last visited May 7, 2021).

scientific evidence are absolute and certain.²⁰² This confronts us with an unpleasant reality that the judiciary is oblivious to the evolving nature of scientific knowledge and have paid scant attention to this non-trivial issue.²⁰³

Recent years have seen a spurred growth of literature from law-science commentators that showcases a disconnect between the world of science and law. Scholars around the world are attempting to vociferously draw attention towards this problem. A wider and more basic question embedded in this issue is regarding the adequacy and efficacy of vetting scientific evidence in courts. Fingers have been pointed towards the competence of the judges, who are sole arbiters of weighing evidence, as gatekeepers. Inadvertence to changing nature of scientific knowledge is nothing but failure of gatekeeping processes for the admissibility of expert evidence and a crisis in the legal system. Moreover, the manner in which forensic evidence are assigning probative value is a mystery in the sense that judgments do not make clear the extent to which reliance is being placed on a piece of evidence and on what basis. A mistaken evaluation of forensic evidence as a gatekeeper remains unknown.

The discourse relating to evaluation of reliability of forensic evidence is at a nascent stage in India. Whereas, across the globe it has been increasingly acknowledged that traditional practice of blindfolded reliance on the manner in which forensic evidence is presented in courts is a real and glaring lacuna in the legal system.²⁰⁴ It is regrettable that, in India, there is dearth of discussion and scholarship on this issue.

Law undoubtedly has to imbibe fast advancing science and technology, yet it is imperative to put in place mechanism that shall ensure rightful and appropriate use of technology in the decision-making process.²⁰⁵ There is no guarantee of a trial being fool proof. Trivial

²⁰² Edmond, Gary, Emma Cunliffe, and David Hamer, *Fingerprint comparison and adversarialism: The scientific and historical evidence*, 83(6) *The Modern L. Rev.* 1287,1298 (2020).

²⁰³ *Id.* at 1321.

²⁰⁴ PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*, EXECUTIVE OFFICE OF PRESIDENT 22 (Sep. 2016).

²⁰⁵ Meera Bangotra, *Use of Modern Scientific Deception Detection Techniques in Criminal Investigation in India: A Study from Constitutional and Human Rights Perspective*, *Journal of Global Research & Analysis*, Vol 5(2), 55 (2016).

discrepancies are part of the system. But, material discrepancies such as these tend to erode away the credibility of the system.²⁰⁶ Justice to the accused and the victim demands that every reasonable measure be taken to ensure that no innocent person is wrongly convicted. The discrepancies that led to wrongful convictions cannot be wholly attributed to the forensic examiners; it is the police, prosecution, defence and the judiciary together that have failed to curtail the menace. Put differently, the problem dealt with in this study is how and why the discovery of limitations inherent in certain forensic science disciplines and wrongful convictions owing to misapplication of forensic evidence has not had a corresponding impact on the way in which these forensic science techniques are assessed in legal settings.

1.7 OBJECTIVES OF THE RESEARCH

This research shall be a part of ongoing debate around the interface of science and law. It shall address the pervasive perception of a potential legal crisis. The purpose of undertaking this research is to acquaint with the mechanism that allows incorporation and admission of science in courts, and thereafter, to expose the fragilities of the system, if any. This is intended to be a systematic and holistic study of the laws, regulations, practices, perspectives and challenges pertaining to the gatekeeping functions of courts. The central objective is to expose the gap between forensic science realities and courtroom practices by analysing the efficacy of rules and courtroom practices. Also, factors that invariably shape the admissibility decisions shall be examined in great detail. The study would try to expose the reasons why the courtrooms are laden with traditional beliefs regarding absolute nature of scientific evidence and are blind to the evolving scientific truths. The study analyses whether traditional tools of propagating established legal principles and maintaining certainty in matters of legal rules are helpful in cases where scientific knowledge is involved. Overall, it is going to be an appraisal of how well the Indian courts are performing qua forensic evidence. This demystification of the courts is important and urgent in light of the burning issues raised in the study. Further, the study shall engage with literature from other jurisdictions to cull out the best and most effective practices from across the globe and present them as suggestions for making required changes in the Indian legal system.

²⁰⁶ *CBI v. Ramesh Chand Dewan*, decided on 29th January, 2018, Delhi District Court.

1.8 SIGNIFICANCE OF THE STUDY

Greeted mostly with optimism, forensic evidence have come to be looked at with suspicion on account of discovery of severe foundational deficiencies. Judges play a central role in admitting and evaluating forensic evidence. Understanding the interaction of legal rules and practices with forensic science lies at the heart of the study. Surprisingly unlike other jurisdictions, there is a serious dearth of discussion around this issue in Indian contemporary legal jurisprudence, despite the fact that danger of wrongful conviction is alike for all countries. This has remained an unexplored area of scholarship in India. The lackadaisical approach towards such a non-trivial matter that has potential of jeopardising the lives of innocent people is a cause of concern. Not just individual freedom but also the integrity of Indian judicial system is at stake. There is an urgent need to address the issues that have been raised in the study. The original contribution of the study lies in the fact that it would not just highlight the need to revamp India's approach towards forensic evidence but would also make suggestions based on laws, safeguards, standards and practices that other countries have adopted in this regard. The study shall expose a void in the Indian judicial system that has been left unattended and has the capacity to cause irreparable damage. As such, it is anticipated that the study would pave way for much needed reforms in the legal system. A lot of work needs to be done in the Indian scientific-legal domain. The study is questioning the credibility or accuracy of assessment of forensic techniques in courts. If the evaluation of forensic evidence is found to be pedantic or unscientific, then it would shake the foundation of a lot of decided cases. It would also demand acknowledging the limitations of forensic techniques and accordingly, assigning appropriate weight to them. This would be challenging and lead demand for review of cases. Yet, this potential disruption shall not be a reason for turning a blind eye to unscientific legal practices.

Justice as an ideal is a basic element of a democratic society and it finds a mention in the preamble of the Indian Constitution itself. The whole of the judicial system is inclined towards safeguarding the interest of an innocent against the need to punish the guilty. India is a country that dearly upholds principles such as, "ten criminals may go unpunished but one innocent person shall not be convicted"²⁰⁷ and "the right to fair

²⁰⁷ *Dinubhai Boghabhai Solanki v. State of Gujarat*, AIR2017SC5690.

trial”.²⁰⁸ All the participants in a legal justice system, parties, lawyers and judges, have a responsibility to ensure that the results of the proceedings are not erroneous or are not affected by flawed expert testimony.²⁰⁹ Leaving room for errors runs counter to the *logos, ethos and pathos* of India’s judicial system. Indian judicial system is already lambasted, perhaps justifiably, for its endemic delays and excessive backlogs, immediate preventive action is needed to save the system from accusation of wrongful conviction.

1.9 RESEARCH QUESTION

Drawing on the review of literature, it is abundantly clear that the Indian legal system is susceptible to significant and mostly unrecognised errors owing to misapplication of forensic science evidence. This fragility of the legal system calls for immediate action and this research could be a preliminary step in that direction.

The research is centred on examining the safeguards in the forms of laws and practices that would shield the system from making wrongful decisions specific to application/misapplication of forensic evidence. With a view to providing a comprehensive response to these concerns, an approach has been adopted which includes study of judgments and laws across various jurisdiction. The study shall examine the practices and laws prevailing in Indian Jurisdiction and other jurisdictions. And, finally, the result obtained shall be analysed and compared to be able to suggest safeguards that can be adopted in Indian legal system.

The following are the research questions that shall be dealt with in detail in the subsequent chapters:

1. What are the legal practices for making the gatekeeping function of judges most effective in other jurisdictions?
2. How do the courts in India assess the reliability of a particular forensic technique?
3. Whether the Indian legal system has adequate safeguards/mechanisms to save it from the danger of totally/partially unreliable forensic evidence/testimonies?

²⁰⁸ *Zahira Habibullah Sheikh & Anr vs State of Gujarat & Ors*, (2006)3SCC374.

²⁰⁹ Hon. Stephen Goudge, *Inquiry into Pediatric Forensic Pathology in Ontario: Final Report*, 2008, p 47.

1.10 SCOPE AND LIMITATIONS OF THE STUDY

It is prudent to set out the scope and limitations of the study at the outset. Laying down the limitations of a research makes clear what is included in the study and what is not.²¹⁰

The study includes analysis of published judgments from District Courts in Delhi for the purpose of understanding the manner in which forensic evidence are being evaluated in courts. This method has certain limitations. For instance, all the information that is determinative in deciding a case does not find a mention in the judgment such as cross-examination. Further, it is not practically feasible to determine the weight that is accorded to forensic evidence as such matter is not categorically spelled out in judgments generally. Yet, it is felt that analysing the judgments is the most feasible approach that can throw light on the functioning of a court. There is no other way of entering into the mind of a judge and culling out various factors that play a role in judicial decision making.

The study is meant to address the issues relating to reliability of forensic evidence as mentioned in the research questions. Other contemporary and burning issues relating to forensic evidence, such as constitutional validity of use of forensic methods, participant's consents etc., have not been touched upon. The study does not intend to confront such wide range of issues. The reason for limiting the scope of the study is to maintain focus throughout the research and remain specific. A fundamental rule is the 'narrower the focus, the more likely the research project is a practical one.'²¹¹

The concerns relating to intersectionality of law and science raised in the study was encountered by the researcher as well. The research being a law graduate, having little training in science and scientific methods, came across exactly the same dilemmas that are faced by judges in their gatekeeping function qua forensic evidence. Therefore, the study is not making any critical comments on the scientific status of any forensic disciplines. It only draws assistance from certain seminal and globally accepted authentic reports relating to forensic evidence. The study is limited to the legal processing of a forensic evidence in courts. The study is drawing assistance from the

²¹⁰ Keith F Punch, *Introduction to Social Research: Quantitative and Qualitative Approaches*, London: Sage Publication 272 (1998).

²¹¹ Guthrie, G., *Basic research methods: An entry to social science research*, SAGE Publications India 28 (2010).

authentic reports from the forensic community to eventually grasp issues of legal importance.

2.0 METHODOLOGY

The chapter aims to provide a comprehensive explanation of the research methodology. It encompasses the detailed description of the methods employed as well as the rationale behind their selection. The chapter is structured into the following sections: Research design, data source, sampling, data analysis, and research plan. The primary feature of this study is the mixed method approach, which combines both doctrinal and non-doctrinal research methods to address the research questions. By utilizing a mixed method approach, it enables the cross-verification of findings. Additionally, it sheds light on both the socio-legal and doctrinal dimensions of the research topic.

2.1 RESEARCH METHOD

Etymologically “research” comes from a French word “recherche” which means “to search or seek again”.²¹² It has also been described as “a systematic, thorough and rigorous process of investigation that increases knowledge.”²¹³ And legal research refers to the systematic study of laws, cases, concepts, rules, theories, principles, doctrines legal issues, problems and a mix of all or some of them.²¹⁴ Further, methodology is a complete approach to the process of research, starting from theoretical framework to the data collection.²¹⁵ It could be a combination of techniques.²¹⁶ Methodology includes both description and justification of methods chosen for research. Thus, it is described as a critical appraisal of all alternative methods and strategies of research.²¹⁷

Methods employed in a study are different from methodology. Method in simple terms means the way or manner in which something is done. On the other hand, methodology means “science of a particular subject.”²¹⁸ Methodology is rationale for using a particular

²¹² Dr. Rattan Singh, *Legal Research Methodology*, LexisNexis 5 (1st ed., 2013).

²¹³ Collis, J and Hussey, R., *Business Research*, Palgrave Macmillan 2 (2nd ed, 2003).

²¹⁴ Yaqin A, *Legal Research and Writing Methods*, India, LexisNexis 1 (2007).

²¹⁵ *Ibid.*

²¹⁶ Easterby-Smith, M.T. and Thorpe, R., *Management research: An introduction*, R. and Lowe 2,342 (2002).

²¹⁷ All Answers ltd, *Qualitative and Quantitative Research Methods* UKEssays.com, January 2020) <https://www.ukessays.com/essays/psychology/adopting-qualitative-and-quantitative-psychology-essay.php?vref=1> (last visited Aug. 22, 2022).

²¹⁸ Tiwary. S, *Doctrinal and Non-Doctrinal Methods of Legal Research*, Amity University, file:///C:/Users/gupta/Downloads/Doctrinal_and_Non-Doctrinal_Methods_of_L.pdf (last visited Aug. 22, 2022).

method or combination of methods in a study.²¹⁹ In terms of Dawson²²⁰ methods consist of tools used in study while methodology is the philosophy or the principles that direct the research. In other words, methods are more about practical sources and presentation whereas methodology is concerns with study of methods itself.²²¹

“If we dig in the garden, we use a spade. If we search for oil, we employ a rock-drill. In other words, the choice of tools depends on the depth to which we intend to probe.”²²² Therefore it is better if the goal of the study is clear. It helps in choosing a suitable method for data collection and also the analysis of that data.²²³ All the techniques that are being used ought to suit the goal of the research.²²⁴ The choice of methodology is also determined by the researcher’s attitude, intuitions, budget and time.²²⁵

Legal research can be broadly classified as doctrinal and non-doctrinal legal research on the basis of focus of the study. It depends on whether it examines theoretical and analytical aspects of ‘law as it is’ or it observe relevant social facts interrelated with law.²²⁶ The doctrinal and social science research are not mutually exclusive.²²⁷

As per McConville,²²⁸ there are historically two major traditions of legal research. First is ‘black letter law’ (or doctrinal research)²²⁹ that focuses mainly on the laws itself as a self-sustaining system and makes no reference to anything outside the law.²³⁰ Second tradition of legal research that started in late 1960s is known as ‘law in context’.²³¹ This approach focusses more on social problem.²³² This gives the study an extra dimension that adds

²¹⁹ Jancowicz, A. D., *Business Research Projects*, Thomson Learning (2000).

²²⁰ Dawson, C., *Introduction to Research Methods 4th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Viva Books (2019).

²²¹ Kroeze, I.J., *Legal research methodology and the dream of interdisciplinarity*, 16(3) Potchefstroom Electronic Law Journal/Potchefstroomse Elektroniese Regsblad 35-65 (2013).

²²² Georg Schwarzenberger, *Reflections on the Law of International Institutions*, 13 Current Legal Prob. 276,289 (1960).

²²³ Bernard, H.R., Wutich, A. and Ryan, G.W., *Analyzing qualitative data: Systematic approaches*, SAGE publications 18 (2010).

²²⁴ *Ibid.*

²²⁵ Dawson, C., *Introduction to Research Methods 4th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Viva Books (2019).

²²⁶ Ashish Kumar Singhal and Ikramuddin Malik, *Doctrinal and socio-legal methods of research: merits and demerits*, 2(7) Educational Research J. 252-256 (2012).

²²⁷ Nolasco, C.A.R., Vaughn, M.S. and del Carmen, R.V., *Toward a new methodology for legal research in criminal justice*, 21(1) J. of Criminal Justice Education 1-23 (2010).

²²⁸ McConville, M. and Chui, W., *Research methods for law 4* (2nd ed., 2017).

²²⁹ *Ibid.*

²³⁰ *Ibid.*

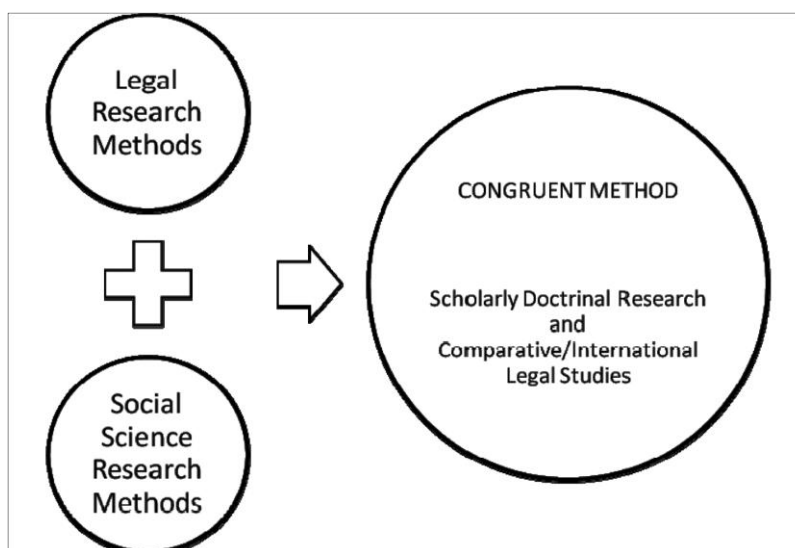
²³¹ *Ibid.*

²³² *Ibid.*

more value to the research.²³³ It is only in 1960s and 1970s that some socio-legal scholars and legal realists began the society and law movement, and highlighted the relevance of studying the gap between ‘law in action’ and ‘law in books’, and also the working of law in social set up.²³⁴

*Khadijah Mohamed*²³⁵ suggests that the two methodologies, doctrinal and non-doctrinal, both have their own limitations and strengths, and therefore using them both together can provide a new understanding and can be more beneficial. It diminishes the chances of bias and other vices of using a single methodology. Supplementing socio-legal science research with doctrinal research also yields more reliable data. For instance, socio-legal research gives the researcher access to the motivations behind a judicial pronouncement or the intention of the legislators while enacting a law. Such information can be highly useful in doctrinal study. The ultimate result is more comprehensive understanding of the issue and enhancement of the overall quality of the research. The two research methods shall be taken as complementary and not be regarded as mutually exclusive.

There is no ranking between methodologies. They are all equally important. Mostly of the times, a combination of methodologies i.e. a mixed method is the one that give a better understanding.²³⁶ A mix of two methodologies mostly gives better results.



²³³ *Ibid.*

²³⁴ *Id.* at 6.

²³⁵ Khadijah Mohamed, *Combining Methods in Legal Research*, 11(21) *The Social Sciences* 5191 (2016).

²³⁶ Ali, S.I., Mohamed Yusoff, Z. and Ayub, Z.A., *Legal Research of Doctrinal and Non-Doctrinal*, 4(1) *International Journal of Trend in Research and Development* 493-495 (2017).

Figure 0-1

The root meaning of doctrinal research comes from the Latin word “doctrina” meaning knowledge, education or learning.²³⁷ Dictionary meaning of Doctrine is “a principle, esp. a legal principle that is widely adhered to.”²³⁸ Technically, doctrinal legal research refers to “research which asks what the law is.”²³⁹

Doctrinal research involves analysis of case law, arranging, ordering and systematising legal propositions, and study of legal institutions, but it does more - it creates law and its major tool (but not the only tool) to do so is through legal reasoning or rational deduction.²⁴⁰

There are various definition provided by various scholars. On the basis of these various definitions it can be deduced that doctrinal legal research is analytical study of laws, cases and other authoritative material in a complete fashion on a particular issue.²⁴¹ It is also known as theoretical research or library based research,²⁴² traditional legal research, basic legal research, arm-chair legal research and also, black-letter legal research.²⁴³ The distinguishing feature of this type of research is that it deals with coherent and accurate description of law and is not interest in scientific theories about it.²⁴⁴

Doctrinal research has played a vital role in development of various legal systems. It is widely used by jurists, lawyers and judges. Doctrinal research has become traditional genre of legal research.²⁴⁵ It is “research in law” and not “research about law.”²⁴⁶

²³⁷Terry Hutchinson; Nigel Duncan, *Defining and Describing What We Do: Doctrinal Legal Research*, 17 Deakin L. Rev. 83,84 (2012).

²³⁸ BLACK'S LAW DICTIONARY 553 (9th ed. 2009).

²³⁹ McConville, M. and Chui, W., *Research methods for law* 21 (2nd ed., 2017).

²⁴⁰ S.N JAIN, *Doctrinal and Non-Doctrinal Legal Research*, in *LEGAL RESEARCH AND METHODOLOGY* (S.K. Verma and M. Afzal Wani eds., 2001).

²⁴¹ Kharel, Amrit, *Doctrinal Legal Research* (February 26, 2018) <https://ssrn.com/abstract=3130525> or <http://dx.doi.org/10.2139/ssrn.3130525> (last visited Aug. 22, 2022).

²⁴² Ashish Kumar Singhal and Ikramuddin Malik, *Doctrinal and socio-legal methods of research: merits and demerits*, 2(7) Educational Research J. 252-256 (2012).

²⁴³ Kharel, Amrit, *Doctrinal Legal Research* (February 26, 2018) <https://ssrn.com/abstract=3130525> or <http://dx.doi.org/10.2139/ssrn.3130525> (last visited Aug. 22, 2022).

²⁴⁴ Khadijah Mohamed, *Combining Methods in Legal Research*, 11(21) The Social Sciences 5191 (2016).

²⁴⁵ Ashish Kumar Singhal and Ikramuddin Malik, *Doctrinal and socio-legal methods of research: merits and demerits*, 2(7) Educational Research J. 252-256 (2012).

²⁴⁶ *Ibid.*

Jurisprudentially it is based on positivism²⁴⁷ or analytical school of law.²⁴⁸ It is the result of this jurisprudential influence that this method looks at what law is and considered law to be neutral, objective and fixed.²⁴⁹

Another important objective of doctrinal research in terms of *S.N. Jain*²⁵⁰ is to provide strong foundation for socio-legal research. The information gained via doctrinal study helps in figuring out the issue more categorically. It is only after having understood the law and legal system that an effective non-doctrinal study can be done which aims at improving the structure as well as function of legal institution in both aspects, substantive and procedural. It would be incorrect to say that doctrinal research is mechanical in nature. A doctrinal researcher also employs his rationality, reasoning and sense of justice in the work.

Various steps involved in this type of research are²⁵¹:

1. Identifying the issue categorically that needs to be researched on;
2. Determining the rules that apply to the issue,
3. Analyzing the issues in light of the applicable law/rules; (most critical step)
4. Drawing a probable conclusion/suggestion.

The analysis part of such research is always a qualitative one.²⁵² It is not so merely because it is non-numerical²⁵³ and does not include statistical analysis of data.²⁵⁴ The modern legal researchers have moved beyond the formalist approach to law.²⁵⁵ They are actively examining the law in social context.

The main purposes of doctrinal legal research are:²⁵⁶

²⁴⁷ *Ibid.*

²⁴⁸ Kharel, Amrit, *Doctrinal Legal Research* (February 26, 2018) <https://ssrn.com/abstract=3130525> or <http://dx.doi.org/10.2139/ssrn.3130525> (last visited Aug. 22, 2022).

²⁴⁹ *Ibid.*

²⁵⁰ S.N JAIN, *Doctrinal and Non-Doctrinal Legal Research*, in *LEGAL RESEARCH AND METHODOLOGY* (S.K. Verma and M. Afzal Wani eds., 2001).

²⁵¹ Ashish Kumar Singhal and Ikramuddin Malik, *Doctrinal and socio-legal methods of research: merits and demerits*, 2(7) *Educational Research J.* 252-256 (2012).

²⁵² Kharel, Amrit, *Doctrinal Legal Research* (February 26, 2018) <https://ssrn.com/abstract=3130525> or <http://dx.doi.org/10.2139/ssrn.3130525> (last visited Aug. 22, 2022).

²⁵³ McConville, M. and Chui, W., *Research methods for law* 21 (2nd ed., 2017).

²⁵⁴ Ian D. and Francis J., *Qualitative legal research. Research methods for law*, 16-45 (2007).

²⁵⁵ *Ibid.*

²⁵⁶ Kharel, Amrit, *Doctrinal Legal Research* (February 26, 2018) <https://ssrn.com/abstract=3130525> or <http://dx.doi.org/10.2139/ssrn.3130525> (last visited Aug. 22, 2022).

- a. To test the present legal principles/theories and to add new one's in the legal system;
- b. To ensure certainty, consistency and continuity of law;
- c. Being focused on 'what law is', it helps in resolving daily legal issues;
- d. To critically and analytically examine pronouncements of courts;
- e. To draw a comparison between laws that are different in terms of time or nature;
- f. Provide foundation for socio-legal research.

Above all, the supreme purpose of doctrinal legal research is to enrich the legal system with new principles, knowledge or concepts.²⁵⁷ The quality of doctrinal research depends upon the sources materials on which the researcher depends upon for his study.²⁵⁸

The theory of legal precedent holds that "Every case lays down a rule, the rule of the case."²⁵⁹ To figure out the 'rule of the case' is not a direct and simple task. A researcher knows that it is not always easy to discover the "rule of the case". The various parts of a case are (i) Heading; (ii) procedural history; (iii) assumed facts; (iv) assumed law; (v) question presented; decision; (vi) reasoning; (vii) rules; and (viii) comments.²⁶⁰ Out of these 8 parts, the researcher shall identify (v) and (vi) part of the case. This is of immense relevance to the researcher. Also, the *obiter dicta* is not always to be disregarded.²⁶¹ It could be of some help as it gives an idea about judicial thinking and reasoning. Though, it is not authoritative or binding.

*P.M Bakshi*²⁶² broadly listed the three major portions of research, namely, analytical, historical and comparative. Analytical is to find out what the law is in its present form. Historical portion refers to the way law evolved and reasons that led to its origin. Lastly, comparative is comparing the legal position in different jurisdictions. Legislators try to learn from each other's experience. In terms of Professor H. C. Gutteridge: " 'Comparative law' denotes a method of study and research and not a distinct branch or department of the law." As per *Van Hoecke*²⁶³ all scholarly research includes comparisons. Comparison of

²⁵⁷ *Ibid.*

²⁵⁸ Dr. S.R. Myneni, *Legal Research Methodology*, Allahabad Law Agency 40 (5 th Edition 2005).

²⁵⁹ John Henry Wigmore, *A Treatise on the Anglo- American system of evidence in trials' at Common Law* 253 (1940).

²⁶⁰ O. Peter W. Gross, *On Law School Training in Analytic Skill*, 25 J. Legal Educ. 261,274 (1972-1973).

²⁶¹ P.M BAKSHI, *Legal Research and Law Reform*, in LEGAL RESEARCH AND METHODOLOGY (S.K. Verma and M. Afzal Wani eds., 2001).

²⁶² *Ibid.*

²⁶³ Van Hoecke, M., *Methodology of comparative legal research*, Law and Method 1-35 (2015).

one's legal system with that of other is often required. It is important that while studying law of a different country for comparison that the case laws and the sociological factors are also inquired into. There is no particular method of doing a comparative study.²⁶⁴

Law does not function in isolation. It is embedded in a social setup. Thus, for a research to be meaningful and result oriented, it shall be based on a strong theoretical foundation and shall take into account the practical realities. In order to keep the law as dynamic as the society, empirical legal research is needed. To understand the ways and manners in which law affects the social context in which it works doctrinal methodology is not enough.²⁶⁵ Though, it is very important for building the theoretical foundation for the socio-legal research. The various social factors make a major contribution in giving shape to laws, making it essential that relation between law and social is included in legal research.²⁶⁶

Scientifically, the term empirical means “gathering of data using only evidence that is observable by the senses.”²⁶⁷ It means using data that is observable.²⁶⁸ The source of information being observable data or first-hand information, the empirical study carries more authenticity.²⁶⁹ The distinguishing characteristic of socio-legal research is the use of systematically collected data to describe and analyse a legal issue.²⁷⁰ It is important to note that ‘socio’ here does not stand for sociology or social. It refers to ‘an interface with a context within which law exists.’²⁷¹

Empirical study has the potential to more clearly reveal the workings of the legal system, to expose its shortcomings, in such a way that no amount of research in library can match.²⁷² An effective reform can never be solely based on theory, principle, concepts etc.

²⁶⁴ *Ibid.*

²⁶⁵ Kharel, Amrit, *Doctrinal Legal Research* (February 26, 2018) <https://ssrn.com/abstract=3130525> or <http://dx.doi.org/10.2139/ssrn.3130525> (last visited Aug. 22, 2022).

²⁶⁶ *Ibid.*

²⁶⁷ *Id.* at 15.

²⁶⁸ *Ibid.*

²⁶⁹ *Ibid.*

²⁷⁰ Cane, P. and Kritzer, H. eds., *The Oxford handbook of empirical legal research*, OUP Oxford (2010).

²⁷¹ Khadijah Mohamed, *Combining Methods in Legal Research*, 11(21) *The Social Sciences* 5191 (2016).

²⁷² Getman, Julius G, *Contributions of Empirical Data to Legal Research*, 35(4) *Journal of Legal Education* 489 (1985).

It requires an inclusive and sociological approach.²⁷³ *Lee E. Teitelbaum* also recommends that empirical research if used in legal field would lead to better results.”²⁷⁴

*Bernard*²⁷⁵ says that in socio-legal studies the focus is on emotions, thoughts, behaviour and artefacts (that is physical residual of one’s emotions, thoughts and behaviour) and also the surroundings wherein people feel, think, behave etc. All of such information when converted to words, pictures and sounds results in data that is qualitative.²⁷⁶ Qualitative research mainly has following objectives – 1) Description, 2) Exploration, 3) testing models, and 4) Comparison.²⁷⁷ The types of data so collected can be in the form of words, videos, sound recordings, pictures or it could be physical objects as well.

*Genn et al*²⁷⁸ claims that empirical study provides answer to questions and issues which the law cannot possibly answer. Such study reveals and explains the practice and procedure of legal system and the manner in which law impacts upon institutions and people.

The non-doctrinal research, also known as socio-legal research methodology, is categorized into two parts: qualitative and quantitative. These methods provide researcher access to the practical realities and the stakeholder’s view point making the study more probing.²⁷⁹ Socio-legal research is helpful in linking law to society. It helps in understanding the relation of law and society and the impact of one over other.²⁸⁰

Qualitative legal research, in very simple, terms is defined as non-numerical, as opposed to quantitative research which is numerical in nature.²⁸¹ It is used mostly when the research

²⁷³ Jurgen Habermas, Faktizitat und Geltung, *Between Facts and Norms: Contribution to a Discourse Theory of Law and Democracy*, diterjemahkan oleh William Rehg, Polity Press, Cambridge 461 (1997).

²⁷⁴ L.E. Teitelbaum, *An Overview of Law and Social Research*, 35 Journal of Legal Education 466 (1985).

²⁷⁵ Bernard, H.R., Wutich, A. and Ryan, G.W., *Analyzing qualitative data: Systematic approaches*, SAGE publications 5 (2010).

²⁷⁶ *Id.* at 10.

²⁷⁷ *Id.* at 8-9.

²⁷⁸ Genn, H.G., Wheeler, S. and Partington, M., *Law in the Real World: Improving Our Understanding of How Law Works: Final Report and Recommendations* (2006).

²⁷⁹ Ashish Kumar Singhal and Ikramuddin Malik, *Doctrinal and socio-legal methods of research: merits and demerits*, 2(7) Educational Research J. 252-256 (2012).

²⁸⁰ *Ibid.*

²⁸¹ McConville, M. and Chui, W., *Research methods for law* 21 (2nd ed., 2017).

seeks to gain insight about the attitude, behaviour and experience of the target population.²⁸² It is useful in gaining access to detailed information.

*Uwe Flick*²⁸³ advocates that choice between qualitative and quantitative method shall be guided by nature of the study, issues involve and the objective. If what the researcher is looking for is subjective as in the experience, perception, believe of his subjects then qualitative methods shall be adopted. Further, when study demands elaborate data that is explanatory and that may be deeply embedded in one's personal knowledge, qualitative study is best suited.²⁸⁴ The goals of qualitative research as per *Anne-Marie Ambert, Patricia A. Adler, Peter Adler and Daniel F. Detzner*²⁸⁵ are:

1. Depth and not the breadth of the information is relevant;
2. Focus is on 'why' and 'how' about behaviour, thinking and understanding of people and not on 'what';
3. Its aim is to find out and discover information, and not to verify.

*Bernard*²⁸⁶ has given three broad classifications of methods of data collection. They are indirect observation, direct observation and elicitation (talking to people). One can choose a mix to these methods for his study. Out of the three, elicitation or talking to people or interviewing people is a social process. In an interview interviewer asks questions and the interviewee provides the answers. It could be categorised as, based on its nature, 1) structured interview (a predetermined set of questions are asked to all interviewees); 2) unstructured interview (it is more like casual conversation and has no fixed pattern); and, lastly 3) semi structured interview (in these questions are partially pre-decided and partially flexible). Interview could either of the following types - unstructured, semi-structured (flexible, interview schedule), structured (rigid structure), Focus group.²⁸⁷

²⁸² Dawson, C., *Introduction to Research Methods 4th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Viva Books (2019).

²⁸³ UWE FLICK, *AN INTRODUCTION TO QUALITATIVE RESEARCH*, 33 (4th ed. 2010).

²⁸⁴ JANE RITCHIE, *The Applications of Qualitative Methods to Social Research in QUALITATIVE RESEARCH PRACTICE: A GUIDE FOR SOCIAL SCIENCE STUDENTS AND RESEARCHERS*, (Jane Ritchie and Jane Lewis eds., 2003).

²⁸⁵ Anne-Marie Ambert, Patricia A. Adler, Peter Adler and Daniel F. Detzner, *Understanding and Evaluating Qualitative Research*, 57 *Journal of Marriage and Family* 879 (1995).

²⁸⁶ Bernard, H.R., Wutich, A. and Ryan, G.W., *Analyzing qualitative data: Systematic approaches*, SAGE publications 18 (2010).

²⁸⁷ Dawson, C., *Introduction to Research Methods 4th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Viva Books (2019).

*Darin*²⁸⁸ opines that interviews are a special type of interaction. It provides required data and information by talking to people. They are primarily interactional. It is important to keep such interactions in check so that information generated is reliable, valid and there is least distortion of what the interviewee knows. In interviews there is a possibility of an element of bias, misdirection, error or misunderstanding and this ought to be minimised. The corrective is that questions shall be asked properly and interviewer shall ensure that the respondent does not deviate from what is relevant. Analysing such data entails coding, grouping and providing a coherent framework.

*Kuldeep Mathur*²⁸⁹ informs that interviewing is an effective means of knowing people's feelings, attitudes, beliefs, motivations, anticipations etc. *Aneeta A. Minocha*²⁹⁰ views Interview as one of the most powerful techniques to yield sociological data and as highly adaptable in working out various research problems and in dealing with different segments of the society. *Jane Ritchie*²⁹¹ views that interviews provide detailed and in-depth information about people's perceptions. *Kuldeep Mathur*²⁹² is of view that less structured interviews are more appropriate where an intensive study of perceptions, motivations and inner feelings is sought to be made. The interviewer allows the respondent to speak, and probes only to elaborate a point or to allow the respondent to talk more. It is a completely flexible approach in which the respondent, to a great extent, determines the nature of interactions. He defines the interviewing situation himself. This type of interview achieves its purpose to the extent that the subject's responses are spontaneous rather than forced; are highly specific and concrete rather than diffused and general; and are self-revealing and personal rather than superficial.

²⁸⁸ Weinberg, D., *Qualitative research methods*, Blackwell Publishing, 112 (2002).

²⁸⁹ Kuldeep Mathur, *Interviewing: Art and skill*, in *LEGAL RESEARCH AND METHODOLOGY*, (S.K. Verma and M. Afzal Wani eds., 2001).

²⁹⁰ Aneeta A. Minocha, *The Interview Technique*, in *LEGAL RESEARCH AND METHODOLOGY*, (S.K. Verma and M. Afzal Wani eds., 2001).

²⁹¹ JANE RITCHIE, *The Applications of Qualitative Methods to Social Research* in *QUALITATIVE RESEARCH PRACTICE: A GUIDE FOR SOCIAL SCIENCE STUDENTS AND RESEARCHERS*, (Jane Ritchie and Jane Lewis eds., 2003).

²⁹² Kuldeep Mathur, *Interviewing: Art and skill*, in *LEGAL RESEARCH AND METHODOLOGY*, (S.K. Verma and M. Afzal Wani eds., 2001).

A good question is one that produces answers that are reliable and valid measures of something we want to describe.²⁹³

Questionnaire is the most commonly used instrument in structured interviews.²⁹⁴ Sreejesh states that questionnaire is a bunch of questions that one asks in an interview.²⁹⁵ It should be such that it is easily understood. Language should be kept clear, simple and unambiguous. It should not be technical. The language and the nature of question shall vary as per the target respondents. Questions shall be arranged in a sequence. It is suggested that the research shall do a preliminary interview to get a hang of nature of the problem better. It could be conducted personally or via mail, telephones etc. The researcher shall be mindful of the respondent's state and ability to answer in an interview. Factors such as forgetfulness, inability to explain, tendency to manipulate etc., shall be taken care of. The questionnaire could be open ended or close ended depending on the degree of freedom the respondent is to be given in their responses. It could be a combination of both open-ended and close-ended questions. Open ended questions are also called as indefinite or unsaturated questions as they can be answered in whatever manner the respondent wants. Open ended questions are those that are answered in the own words of the respondent.²⁹⁶ There is no limit to length or nature of the response. The sub categories of open-ended questions are free responses, probing etc. Closed ended questions are those wherein the respondent has to choose from the list of given responses. The responses are pre-decided.²⁹⁷ They are subcategorised as ranking, binary, multiple choice, checklist questions. The presentation of questionnaire should be preceded by a brief introduction of the study and its purpose. The sequence in which questions are presented is of immense importance. It is said that questionnaire shall be "funnel-shaped." It means that it shall start with general questions and then shall move towards specific ones. There are a variety of questions depending on the purpose they serve, such as - 1. Lead-in question - to break the ice, 2. qualifying, 3. warm-up, 4. specific questions, 5. Demographic questions.

²⁹³ Fowler Jr, F.J. and Fowler, F.J., *Improving survey questions: Design and evaluation*, Sage 2 (1995).

²⁹⁴ Bernard, H.R., Wutich, A. and Ryan, G.W., *Analyzing qualitative data: Systematic approaches*, SAGE publications 33 (2010).

²⁹⁵ Sreejesh, S., Mohapatra, S. and Anusree, M.R., *Questionnaire design. In Business Research Methods*, Springer, Cham 143 (2014).

²⁹⁶ Dawson, C., *Introduction to Research Methods 4th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Viva Books (2019).

²⁹⁷ *Ibid.*

*Gendall*²⁹⁸ suggests that objectivity is an important element of a good questionnaire. The researcher shall keep his perspective aside and shall not lead or influence respondents. There are several layers of a questionnaire. They are: objectives, questions, words and layout. These are closely bound layers and cannot be separated. *Dawson*²⁹⁹ suggests that 'double barrelled' questions shall be avoided. These are the questions that complex in nature i.e., two questions are clubbed in one question. *Cannell and Kahn* - recommended using open-ended questions when the objective is to discover people's attitude and beliefs and the basis on which someone had formed an opinion.

A well framed question requires a thorough understanding of the subject.³⁰⁰ *Bakshi*³⁰¹ certain guidelines for preparation of an questionnaire

1. Short questions to be preferred;
2. Precision in questions;
3. Grouping the questions, when the number of questions is more
4. Giving heading to questions;
5. Should not be frightening, the language should be such that the respondents readily respond to it.

The selection of tools and methodologies for this study is shaped by the theoretical foundation of the topics at hand. Chapter 1, Section 1.2 delves into the theoretical framework of the study. A thorough examination of the theory reveals that there is a lack of statutory guidance in the research area. The legal system has not kept up with the progress of forensic science and its application in the legal system. Some limited guidelines have been established by the courts through judicial precedents. Therefore, to address the research inquiries, it is essential to seek assistance from other countries where the law and relevant legal principles have developed. Furthermore, due to the absence of legislative direction, it is crucial to seek answers by directly acquiring knowledge on the subject from judges. Judges play a central role in the gatekeeping function, which is

²⁹⁸ Gendall, P., *A framework for questionnaire design: Law revisited*, 9 Marketing Bulletin-Department of Marketing Massey University, 28-39 (1998).

²⁹⁹ Dawson, C., *Introduction to Research Methods 4th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Viva Books (2019).

³⁰⁰ P.M BAKSHI, *Legal Research and Law Reform*, in LEGAL RESEARCH AND METHODOLOGY 411 (S.K. Verma and M. Afzal Wani eds., 2001).

³⁰¹ *Ibid.*

fundamental to this study. Understanding their perspectives, knowledge, and attitudes can be achieved through direct interviews or by analyzing their written judgments.

Resultantly, the present study is designed to converge the two methodologies, doctrinal and non-doctrinal, and combine them into one combination methodological that draws benefits from both research methods. The two methodologies complement the limitations of each other.³⁰² Socio-legal part of study can incorporate practical side of the issue, whereas doctrinal part would provide the study with a firm theoretical framework. Harmonisation of doctrinal and non-doctrinal legal research methods to solve real life legal problems is the most appropriate method.³⁰³ The motivation behind employing a combination study is to achieve enrich the legal system with rules that are relevant in view of the social/contextual issues. Combining the two methodologies, i.e. socio-legal and doctrinal results in better understanding of law.³⁰⁴ Also, doctrinal research has come to be criticised as “intellectually rigid, inflexible and inward looking’ way of understanding the legal system and law.³⁰⁵ It is very important to note that the two methodologies are complementary to each other and can be used together simultaneously in relation to an issue.³⁰⁶ Modern legal researchers are not restricted to formalistic approach to study of rules or laws. It is being acknowledged that legal studies, right evaluation of problem and its solution require a social context and demand for combining doctrinal study with empirical approach.

The first research question, i.e., what are the legal practices for making the gatekeeping function of judges most effective in other jurisdictions, shall be answered with the help of doctrinal study of law and practices in other common law jurisdiction. The aim of this research question is to draw a comparison between the legal practices in India and other countries and, as point out by *Kharel*,³⁰⁷ doctrinal research is best suited for this purpose.

In order to conduct a comparative study, it is crucial that the context surrounding the subject matter remains consistent.³⁰⁸ Given that forensic evidence is a topic that transcends

³⁰² *Ibid.*

³⁰³ Kharel, Amrit, *Doctrinal Legal Research* (February 26, 2018) <https://ssrn.com/abstract=3130525> or <http://dx.doi.org/10.2139/ssrn.3130525> (last visited Aug. 22, 2022).

³⁰⁴ Ashish Kumar Singhal and Ikramuddin Malik, *Doctrinal and socio-legal methods of research: merits and demerits*, 2(7) Educational Research J. 252-256 (2012).

³⁰⁵ D. W. Vick, *Interdisciplinary and the Discipline of Law*, Journal of Law and Society 164 (2004).

³⁰⁶ McConville, M. and Chui, W., *Research methods for law* 6 (2nd ed., 2017).

³⁰⁷ Kharel, Amrit, *Doctrinal Legal Research* (February 26, 2018) <https://ssrn.com/abstract=3130525> or <http://dx.doi.org/10.2139/ssrn.3130525> (last visited Aug. 22, 2022).

³⁰⁸ Van Hoecke, M., *Methodology of comparative legal research*, Law and Method 1-35 (2015).

national boundaries, it is feasible to carry out such a comparative study. The examination of laws in different jurisdictions was conducted in a systematic manner. Four specific parameters were predetermined for the purpose of comparison, namely, rules regarding admissibility, principles governing the gatekeeping function, expert responsibilities towards the courts, and the regulations pertaining to the appointment of experts by the court. The laws and judicial rulings pertaining to these four areas were identified and subjected to a thorough comparison. The second research question, i.e., how do the courts in India assess the reliability of a particular forensic technique, shall be dealt with a twin approach. The first limb of this approach would be to capture the perspective of judges by means of interview. Thus, it would be empirical in nature. The other limb of the approach would be to cull out from the reasoning provided in judgments the manner in which reliability of forensic evidence is assessed. This part would involve study of judgments and hence would be doctrinal in nature. The last research question i.e., whether the Indian legal system has adequate safeguards/mechanisms to save it from the danger of totally/partially unreliable forensic evidence/testimonies, shall be answered on the basis of the results obtained from the first questions. The answer to the first research question shall provide information regarding the best legal practices to be followed for assessment of forensic evidence. The answer to second research question shall provide information on the manner in which assessment is being conducted in courts in India. Put together, the comparison of the information so obtained would indicate whether the present Indian legal practices of evaluation are in line with the best practices around the world. The other details relating to the place of research, extent of judgments analysis, the prospective participants for the empirical study, etc has been provided in the section 2.1, 2.2, 2.3 and 2.4 that related to research design.

2.1 RESEARCH DESIGN

Research design is a lay out of what type of data is needed to answer research questions and clearly specify the approach that shall be adopted to generate/gather that data.³⁰⁹ There are always more than one way to design one's research. It involved working through numerous strategies and work out a well thought out idea of how the researcher intends to carry out the research.

³⁰⁹ Gibson, W. and Brown, A., Working with qualitative data. Sage 47 (2009).

The present research is intended to be a combination of doctrinal and socio-legal research. The study has three research questions. The research involves a study of admissibility standards and practices employed in courts in various jurisdictions in order to scrutinise the reliability of forensic evidence. This would answer the first research question. It would give a comparative perspective to the understanding of Indian courtroom practices vis-à-vis standards/methods/strategies employed in other similar jurisdictions pertaining to admissibility of forensic evidence.

The research questions, i.e., how do courts in India assess the reliability of a particular forensic technique, is being answered in two parts. The first part constitutes review of judgements from the district courts in Delhi ranging from Jan, 2016 to Dec, 2020, i.e., 5 years. To be more specific, the study would extensively deconstruct and examine the judgements wherein the reliability of forensic evidence is being examined in order to establish the strategy/standards employed by judges while dealing with issues of reliability of forensic evidence. The researcher, thereafter, examines whether the scientific knowledge applied in courts in matters of forensic evidence is disjointed from the updated status of forensic techniques.

Published judgments of trial court provide an insight into the kind of challenges that are raised against admission of forensic evidence and also the pattern of judicial responses.³¹⁰ The trial court case analysis method has been used by many scholars primarily for the purpose of gaining an in-dept understanding of judge's gatekeeping function.³¹¹

Analysis of published case law does not necessarily capture the decision-making process fully. Given the limitation of reviewing judgments, it was felt most desirable to get an insight directly from the judges. Moreover, such a versatile approach of research relating to the issue at hand has been used in other studies as well.³¹² The part of the research would

³¹⁰ Mara L. Merlino, Colleen I. Murray & James T. Richardson, *Judicial gatekeeping and the social construction of the admissibility of expert testimony*, 26 BEHAV. Sci. & L. 187,205 (2008).

³¹¹ Dixon, L., & Gill, B., *Changes in the standards for admitting expert evidence in federal civil cases since the Daubert decision*, 8(3) Psychology, Public Policy, and Law, 251 303 (2002); Krafka, C., Dunn, M. A., Johnson, M. T., Cecil, J. S., & Miletich, D., *Judge and attorney experiences, practices, and concerns regarding expert testimony in federal civil trials*, 8(3) Psychology, Public Policy, and Law 309 332 (2002); Johnson, M. T., Krafka, C., & Cecil, J. S., *Expert testimony in federal civil trials: A preliminary analysis*, Washington, DC: Federal Judicial Center (2000).

³¹² Gatowski, S.I., Dobbin, S.A., Richardson, J.T., Ginsburg, G.P., Merlino, M.L. and Dahir, V., *Asking the gatekeepers: A national survey of judges on judging expert evidence in a post-Daubert world*, 25(5) Law and Human Behavior 433-458 (2001).

shed light on the judicial perspective with respect to current debate, the researcher turned to the gatekeepers themselves directly. The aim is to assess the extent to which the judiciary is able to comprehend the forensic evidence, analyse whether judges have difficulty in evaluation of their weight, the different criteria adopted by judges in the evaluation process etc. Survey of district court judges would provide empirical evidence relating to admissibility decision making. It would comprise of survey with judges from Delhi district courts. The survey would be in the form of a structured interview. The questionnaire shall have open ended questions. Such questions give the researcher, and also the interviewee, maximum liberty for interaction. The choice of words and length of an answer is left to the interviewee. Different participants may answer the same question differently. Some may devote more attention to a particular question showcasing their interest/knowledge on a particular issue. This enables the researcher analyse the responses intensely.

The last research question, i.e., whether the Indian legal system has adequate safeguards/mechanisms to save it from the danger of totally/partially unreliable forensic evidence/testimonies, is a concluding part of the research, and, hence, the most significant part. The answer to this question is intended to be derived with the help of the research undertaken with respect to research questions 1 and 2. The scheme of attending to this question would be comparative. The results culled out of the first two questions shall be compared in order to see where India stands in its approach towards forensic evidence. Consequently, this part of the study would also be doctrinal. The answer to this research question would involve findings from the first and the second research questions, and therefore, would not be comprising of new research data or study. It would be, for the most part, analytical and comparative.

2.2 DATA SOURCES

The source from which data for a study is gathered is what distinguishes doctrinal from non-doctrinal legal research.³¹³ In relation to socio-legal research, primary data refers to ‘first-hand information’ obtained by the researcher.³¹⁴ Secondary data is the information generated after the event has happened and which has not been personally witnessed by

³¹³ *Ibid.*

³¹⁴ Teddlie, C. and Tashakkori, A., *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*, Sage (2009).

the researcher, like bulletins, publications, journals, library records, case studies, online information etc.³¹⁵

As regards empirical part of the present study, the survey would be conducted using interviews as survey instrument and the participants would be judges from Delhi district courts. Though the sample for study is localised, the study is meant to raise issues of general importance and can be replicated in other parts of the country in future. The researcher is situated in Sonapat, Haryana. The two practically feasible options available were Haryana or Delhi. The researcher chose Delhi as its relatively smaller and doable compared to Haryana given the time and resources constraint. The obvious reason behind choosing to study district courts judgments was that the district courts are the forums where trial is conducted, evidence is admitted, witnesses are examined and a detailed enquiry of the case is done. Trial courts are the first forum to deal with admissibility issue of evidence. The higher courts, where a case goes in appeal, do not always look into the matters pertaining to admissibility of evidence. For these reasons, there is less likelihood of judgments of higher courts having a discussion on reliability of forensic evidence.

Since the objective of the study is to analyse the admissibility process of forensic evidence it is appropriate to also focus on judgments of the Delhi district courts. As regards the range of time from which judgments were studied, i.e., 5 years, the initial plan was to study judgments ranging back to 10 years. But, as the research was carried out from December 2020 in a backward fashion, after having studied cases till 2016 it was realised that same data was being repeated. After thoroughly examining cases from the past 5 years, it became evident that no further information or data could be obtained. It was concluded that additional study did not yield any new information or findings. Consequently, it became certain that the data had reached a saturation point. Having reached data saturation, the study of judgments was restricted to 5 years only. Thus, the primary reason for limited to the study to 5 years was data saturation.

Judgments available at the www.indiankanoon.org have been used as the database for Delhi District Court Judgments. The judgments available on the official website of the Delhi District Courts are not present in a research friendly manner. On the official court

³¹⁵ Henn, M.W., M. & Foard, N, A short introduction to social research (2006).

websites there is no tool/mechanism of refining judgments based on a keyword. Whereas, *indiankanoon.org* provides an option of refining search with the help of keywords. The website provides a state of the art “search functionality.” It has certain useful features such as showing “document fragments”. This means that the portion/fragments of the judgment that contains the keywords is shown separately. Similar prior studies have been carried out using unofficial sources as database. For instance, a widely cited study by *Dixon and Gill* that studies expert evidence admissibility decisions used Westlaw as database because it allows district court opinions to be searched electronically.³¹⁶ Likewise, district court cases published on Lexis were used as database for a similar study by *Victoria and Merlino*.³¹⁷

Doctrinal study does not involve field work or collection of primary data. Doctrinal legal research is based on secondary data which could come from primary or secondary authority.³¹⁸ Secondary data could be statutes, judicial pronouncements, laws, legal concepts, values, principles, other legal texts. Primary authorities are those that come from authentic bodies, such as parliament, state legislative bodies, judiciary etc. It includes laws, statutes, delegated legislation, treaties, case law etc. Secondary authorities are those that are not authoritative and that explain or comment on primary authorities. Primary authorities could be either binding or merely persuasive depending on the legislative competency of the authority concerned and the status of the issue at hand.³¹⁹ For instance, decision by a division bench of a High Court is binding on a single bench of the same High Court and is only persuasive for High Courts of other states. Similarly, the secondary authorities like text books, journal articles, commentaries, conventional legal theories etc. are also persuasive only.³²⁰ Despite being only persuasive in nature, these secondary authorities are crucial and useful in research. They help in better understanding of primary authorities.³²¹

³¹⁶ Dixon, L., & Gill, B., *Changes in the standards for admitting expert evidence in federal civil cases since the Daubert decision*, 8(3) *Psychology, PublicPolicy, and Law*, 251,266 (2002)

³¹⁷ Springer, Victoria A., and Mara Lee Merlino, *Factors Used in US Circuit Court Judges' admissibility Decisions in Psychological/Psychiatric, Toxicology, Damages, and Engineering Cases*, *Psychiatric, Toxicology, Damages, and Engineering Cases* 2 (2010).

³¹⁸ *Ibid.*

³¹⁹ *Ibid.*

³²⁰ *Ibid.*

³²¹ Ashish Kumar Singhal and Ikramuddin Malik, *Doctrinal and socio-legal methods of research: merits and demerits*, 2(7) *Educational Research J.* 252-256 (2012).

Constitution, Statutes, legal rules (administrative regulations) and court decisions, are all primary authorities. These are sometimes described as “the law.” The commentary or analysis of the primary authorities is called the Secondary authority. The importance of this distinction lies in the fact that secondary is only persuasive authority and is not binding. Yet, the secondary authority helps in analysis of complex legal issues. Primary authority is sometimes binding and sometimes persuasive. The jurisdiction and the hierarchy of court shall determine whether the primary authority is binding or is only persuasive in nature.³²² Doctrinal research being research into laws, involves study of judicial pronouncement, legal concepts, doctrine and of course, laws. It also includes, study of history of laws, parliamentary debates as that helps in figuring out what legislature actually intended.³²³

Thus, in order to carry out the comparative part of this study, laws, judgments and scholarly writings of India and other jurisdictions with respect to the research question shall be studied. Study of other countries’ legal system shall benefit the Indian legal system as it provides suggestions and also warnings of possible hurdles.³²⁴ This is more specifically applicable to countries that have borrowed provisions of Constitution or Codes from other countries,³²⁵ such as India. This is precisely why it is often referred to as a bag of borrowings. Even in courts it is found that cases from other common law jurisdiction are being cited showing a natural tendency to benefit from other similar jurisdiction.³²⁶ A crucial question is what countries to choose for comparison. This decision was made on the basis of the legal system of a country. Since India is a common law country, other common law countries with similar legal system were chosen for the purpose of the comparative study. The countries that were found most relevant for the present discussion are: U.S.A, England, South Africa, Singapore, Canada, Australia.

The judgments of Indian High Courts and Supreme Court have been obtained mostly from softwares such as SCC and manupatra. Previous Indian theses have been referred from shodhganga.inflibnet.ac.in. The scholarly articles have been searched on software

³²² Amy E. Sloan, Basic Legal Research: Tools and Strategies, Aspen Publishers 4-6 (3rd ed, 2006).

³²³ Dr. Rattan Singh, Legal Research Methodology, LexisNexis 5 (1st Edition, 2013).

³²⁴ McConville, Research methods for law. Edinburgh University Press 163 (2nd ed., 2017).

³²⁵ *Ibid.*

³²⁶ *Id.*, at 164.

available on electronic resources on the JGU website such as Heinonline, JSTOR, Oxford Journal, Westlaw India etc.

2.3 SAMPLING

Data collection is a crucial stage in research. It is extremely important that the data collected is both relevant and valid so that the results generated out of the study are reliable.³²⁷ It is the research question and objective that shall determine the methods to be used for data collection.³²⁸ First and foremost task at the time of data collection is choosing a sample and that shall determine how the questions are to be framed in order to get relevant information.³²⁹ The sampling technique depends on resources, time, budget etc. It is important to remain realistic. There are different types of sampling such as, simple random sampling, cluster sampling, quota sampling, snow ball sampling, stratified sampling etc.³³⁰

As regards the interview part of this research, it would be suitable to use snowball sampling technique for data collection. The participants of the study would be judges. It is well known that having access to judges and to be able to extract information from them is not easy. Snowball sampling technique is a useful tool in overcoming this hurdle. It is easier to get in touch with judges through people they know.

Snowball sampling means a sampling technique where one participant recruits another. It is mostly used when getting desired people to participate in research is difficult. It is non-probability sampling. The steps involved in this are –

1. To figure out accessible participants;
2. Gaining access to other participants through them.

This process is carried out till the sample size is good enough. Snowball sampling is also called as cold-calling, chain sampling, chain-referral sampling, and referral sampling.

Despite being aware of the difficulty in approaching a judge for interview, an attempt was made to approach a judge randomly. The researcher went and sat in a courtroom in Rohini

³²⁷ Khadijah Mohamed, *Combining Methods in Legal Research*, 11(21) The Social Sciences 5191 (2016).

³²⁸ *Ibid.*

³²⁹ Sreejesh, S., Mohapatra, S. and Anusree, M.R., *Questionnaire design. In Business Research Methods*, Springer, Cham 143,144 (2014).

³³⁰ Dawson, C., *Introduction to Research Methods 4th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Viva Books 50 (2019).

District Court, Delhi. As soon as the judge got up from his chair and went to his chamber, the researcher sought the permission to meet him through his secretary. The first judge so approached refused to speak for a research project. Thereafter, the researcher went to another judge's courtroom in the same court premises. This second judge agreed to talk and the moment a permission was sought to record the conversation the judge got alarmed. She directed the researcher to speak to District and Sessions judge (their senior) first and get her permission for an interview of any sort. The District and Sessions judge asked the researcher to submit the questionnaire so that the District and Sessions judge could review the content and nature of the questions and accordingly decide whether or not to give permission. Few days later, several attempts were made to find out if permission was granted or refused. The secretary to the District and Sessions judge kept deferring the request to meet the District and Sessions judge. Eventually, the researcher had to opt for snowballing. Hence, a judge known to the researcher was approached. With the help of the first participants other judges were approached. In the process, certain senior judges when approached for interview refused to participate. Some judges did not even answer the text messages or calls. Eventually those who showed interest in participation were interviewed. The process of data collection through interviews was limited to 20 judges as the data has reached a saturation point.

Description of Participants (N=20)

Participant	Age	Gender	Time on the Bench	Highest Educational Qualification	Advocacy Experience (in years)	Scientific Literacy	Time duration of the Interview
1	35	M	7.5	LLM	-	12 th	38
2	32	M	6	LLM	-	12 th	36
3	33	F	5	LLM	3.5	10 th	43
4	29	M	4	LLM	-	12 th	29
5	31	M	4	Pursing LLM	-	10 th	43
6	28	M	2	LLB	5	B.Tech.	26
7	30	M	2	LLM	4	10 th	13
8	40	M	13	LLM	-	12 th	28
9	29	F	1	LLB	-	10 th	26
10	33	F	2	LLM	4	12 th	13
11	29	M	3	LLM		12 th	14
12	27	M	2	LLB	-	10 th	18
13	30	M	4	LLB	-	12 th	32

14	34	M	5	LLM	-	12 th	45
15	28	F	2	LLM	-	12 th	19
16	31	M	3	LLM	-	12 th	37
17	28	M	3	LLM	-	10 th	24
18	29	M	2	LLM	-	12 th	27
19	34	M	4	LLM	-	12 th	32
20	28	M	2	LLM	-	10 th	19

Figure 0-2

As regards the case analysis part of the study, the cases from Delhi District courts are provided on the database year wise and month wise. The search was started from the year 2020 (January). With the help of ‘expert’ as search string or keyword the cases were filtered. The search was carried backwards till the year 2016(December). As the data was being repeated and saturation in data was attained, the search was limited to 5 years i.e., January 2016 to December 2020. The graphical representation of sample so drawn is shown below.

	Total (expert)	relevant	civil	criminal
2016	774	361	42	319
2017	580	292	44	248
2018	1003	445	75	370
2019	826	353	51	302
2020	478	167	34	133
total	3661	1618	246	1372

Figure 0-3

Upon examining these statistics, it becomes evident that a significant contrast exists between the overall number of cases and the cases found relevant. This suggests a prevailing inclination towards the routine acceptance of expert evidence in court, devoid of thorough analysis or deliberation. Furthermore, the data presented in the table unmistakably indicates a greater utilization of forensic evidence in criminal cases

compared to civil cases. This discrepancy may likely stem from the higher stakes involved in criminal cases, which tend to be fiercely contested.

2.4 DATA ANALYSIS

After questionnaire or interview responses have been obtained, the next task of the researcher is to prepare the data for analysis. Analysis is the process of examining, summarising, and drawing conclusions from the information contained in the raw data.³³¹ Dawson³³² asserts that how one analyses the data is highly influenced by personal factors such as preferences, educational background etc. In case of analysis of quantitative data various statistical tools are used. And, in case of qualitative data analysis becomes a personal process. Meaning analysis is subjective to the person analysing the data. Same qualitative data when analysed by two different people can yield different conclusions. Quantitative data is analysed at the end of the research. While in case of qualitative data, analysis is a continuous process. The researcher analyses data along the process of data collections. It is important that one takes memos and field notes (things that you observe by eyes and ears in the surroundings) while doing qualitative research.

Bernard³³³ says analysis is like “looking for regularities” in the data set. The first step in systematic analysis is the conversion of audio into digital text. "Transcription" means converting an audio recording into digital text (a file on a computer). It involves five complex tasks -

1. Discovering themes and sub-themes,
2. Describing the core and peripheral elements of themes,
3. Building hierarchies of themes or codebooks;
4. Applying themes meaning attaching them to chunks of actual texts; and

³³¹ Anwarul, Y., *Legal Research and Writing Methods*, Lexis Nexis Butterworths Wadhwa, Nagpur 202 (2008).

³³² Dawson, C., *Introduction to Research Methods 4th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Viva Books 114 (2019).

³³³ Bernard, H.R., Wutich, A. and Ryan, G.W., *Analyzing qualitative data: Systematic approaches*, SAGE publications (2010).

5. Linking themes into theoretical models.³³⁴ The themes may emerge from the data collected or could come from research prior theoretical understanding.

Qualitative data analysis is somewhat personal in nature. Resultantly, the same set of transcripts analysed by two different people can yield different results depending on their methodological and political standpoints.³³⁵ As special a feature, qualitative research analysis may be carried out as the research advances.³³⁶ The researcher may want to reorganise and refine the survey instrument as data emerges. Choice of a method for qualitative data analysis is dependent on several factors, such as, area of research, researcher's personal preferences, availability of resources etc.³³⁷

As regards the present study, the data collected from the survey with judges was analysed by theme continuously emerging from reviewed literature and the survey. Given the fact that this study is a first of its kind and engages with questions about personal experiences of judges with admissibility decisions, there are high chances that the survey provides some information that ought to be included in the survey instrument. Thematic analysis of the data, remarkably, gives the liberty to the researcher to refine and reframe the survey instrument and be able make the newly discovered information part of the survey. This is precisely why it is called a highly inductive process. Inductive process entails observing patterns and formulating theories to explain those patterns.³³⁸ The objective of this methodology is to derive themes from the gathered dataset with the purpose of recognizing patterns and connections in order to construct a theory. Nevertheless, the inductive approach does not hinder the researcher from utilizing pre-existing theories to formulate the research question that will be investigated.³³⁹ The research is not bound to stick to pre-decided themes. In other words, in a process of this sort data collection and analysis goes on simultaneously. On the other hand, deductive methods include “developing a hypothesis (or hypotheses) based on existing theory, and

³³⁴ *Id.* at 54.

³³⁵ Dawson, C., *Introduction to Research Methods 5th Edition: A Practical Guide for Anyone Undertaking a Research Project*, Robinson 114 (2019).

³³⁶ *Id.* at 115.

³³⁷ *Id.* at 116.

³³⁸ Bernard, H.R., Wutich, A. and Ryan, G.W., *Analyzing qualitative data: Systematic approaches*, SAGE publications 7 (2010).

³³⁹ Saunders, M., Lewis, P. & Thornhill, A., *Research Methods for Business Students*, 6th edition, Pearson Education Limited (2012).

then designing a research strategy to test the hypothesis.”³⁴⁰ Deductive reasoning is the process of deriving specific conclusions from broad principles or premises. Inductive and deductive analysis can be distinguished by the source of the themes. In the case of inductive method, the themes are derived directly from the data itself. Conversely, in the deductive method, the themes are drawn from the pre-existing theoretical data.³⁴¹

Inductive research methods were utilized for this study. The interview questionnaire was designed with a foundation in existing theories. Nevertheless, the findings were determined from the participants' responses. The data analysis was centered around the themes that shaped the questionnaire, which were derived from the literature review. Thus, it would be incorrect to say that the research was fully inductive.

The data so gathered would be thematically analysed. Thematic analysis is a method of analysing qualitative data.³⁴² The process entails analyzing the data in its raw form, subsequently identifying the pertinent text, then discovering the patterns, and ultimately categorizing these patterns into themes.³⁴³ Thematic analysis involves primarily following six steps:

1. Familiarizing yourself with your data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report³⁴⁴

The primary responsibility of a researcher is to thoroughly engage with the data. This entails transcribing the data (in the case of an interview) and repeatedly reviewing it. Although this task may be tedious and time-consuming, it is an essential step in data

³⁴⁰ Wilson, J., *Essentials of Business Research: A Guide to Doing Your Research Project*, SAGE Publications 7 (2010).

³⁴¹ Joffe, H., & Yardley, L., *Content and thematic analysis. Research methods for clinical and health psychology*, London: Sage, 57 (2004).

³⁴² Riger, S & Sigurvinsdottir, R., THEMATIC ANALYSIS. HANDBOOK OF METHODOLOGICAL APPROACHES TO COMMUNITY-BASED RESEARCH: QUALITATIVE, QUANTITATIVE, AND MIXED METHODS, 33-41 (Oxford University Press, 2016).

³⁴³ Auerbach, C. and Silverstein, L.B., *QUALITATIVE DATA: AN INTRODUCTION TO CODING AND ANALYSIS*, (Vol. 21) (NYU press, 2003).

³⁴⁴ Braun, V. and Clarke, V., *Thematic Analysis Revised—Final*, 3(2) *Qualitative Research in Psychology* 77-101, 87-93 (2006).

analysis. It is during this stage that researchers may begin to uncover potential themes and gain insights. Therefore, it is crucial to approach this step with patience and unwavering dedication. It is advisable to take notes while reading the transcripts, as this allows for capturing and documenting various thoughts that arise in the researcher's mind. Furthermore, these notes serve as evidence of the analysis's reliability and authenticity. The recurring patterns identified in the data may be referred to as Codes.³⁴⁵ Next step is to generate codes. Coding entails identifying patterns within the data and segmenting the data to enhance comprehension of its intricate details. To achieve this, codes are assigned to the identified patterns. The data is then organized into distinct categories to differentiate between various aspects of its content. Subsequently, the researcher may consider exploring a theme. This can be done by exploring ways in which difference codes can be brought together under one broad concept. A theme denotes a distinct pattern identified within the data.³⁴⁶ There should clear coherence between the data, codes and the theme.³⁴⁷ Themes once framed shall be reviewed in order to ensure that they cover the entire data set.

Ensuring reliability and validity in analysis is a crucial element of research. Triangulation is a method used to guarantee the reliability of research findings by cross-referencing evidence from different sources, which helps to improve credibility, validity, and reliability.³⁴⁸ This approach offers advantages like minimizing bias and establishing credibility. The current study utilizes various research methods, including comparing laws across different jurisdictions, analyzing judgments, and conducting direct interviews with judges. The results obtained from these methods will indicate the consistency and therefore the reliability of the conclusions.

³⁴⁵ Joffe, H., & Yardley, L., *Content and thematic analysis. Research methods for clinical and health psychology*, London: Sage, 58 (2004).

³⁴⁶ Joffe, H., & Yardley, L., *Content and thematic analysis. Research methods for clinical and health psychology*, London: Sage, 57 (2004).

³⁴⁷ Riger, S & Sigurvinsdottir, R., THEMATIC ANALYSIS. HANDBOOK OF METHODOLOGICAL APPROACHES TO COMMUNITY-BASED RESEARCH: QUALITATIVE, QUANTITATIVE, AND MIXED METHODS, 35 (Oxford University Press, 2016).

³⁴⁸ Thurmond, V.A., *The point of triangulation*, 33(3) J. of Nursing Scholarship, 33(3), 253 (2001).

2.5 RESEARCH PLAN

The plan for this study is spread over a period of three years. The details plan is given below

Preparation of Research Proposal	February, 2019 – August, 2020 (delayed due to COVID-19 Pandemic)
Study of Delhi District Court Judgments	September, 2020 – December, 2020
Doctrinal Study of other jurisdictions	January 2021 – May, 2021
Interviews with Judges	June, 2021 – July, 2021 (vacation time for judges)
Thesis writing	August 2021 – January, 2023

Figure 0-4

The table below specifies the particular date on which each participant was interviewed.

Participant	Date of Interview
1	4-6-2021
2	5-6-2021
3	7-6-2021
4	7-6-2021
5	8-6-2021
6	12-6-2021
7	15-6-2021
8	21-6-2021
9	6-6-2021
10	21-6-2021
11	22-6-2021
12	22-6-2021
13	27-6-2021
14	27-6-2021
15	16-7-2021
16	11-7-2021
17	10-7-2021
18	5-7-2021
19	3-7-2021
20	28-6-2021

Figure 0-5

2.6 ETHICS

Ethics are standards of professional behaviour. In simple terms it guides us regarding our conduct and attitude towards participants in the research. Adherence to ethics is

fundamental to any research. It promotes and safeguards values that are of paramount importance in any research, such as truth, fairness, accountability, mutual respect etc.³⁴⁹ Most importance aspect of ethics is to show respect towards the participants without whose cooperation and participation no research is ever possible. There are a range of ethical dimensions that shall be considerations in research. The most common ones are³⁵⁰ –

1. Voluntary Participation
2. Informed consent
3. Anonymity
4. Confidentiality
5. No harm (including environmental, psychological harm)

Some of the other ethical principles in research are honesty, objectivity, integrity, carefulness, openness, transparency, respect for colleagues, social responsibility, competence, legality, etc.³⁵¹ Seeking permission, as an important element of ethics in research, apply in two areas. First is when approval is required from the academic institution to carry out the study. Second, is obtaining consent, formal or informal, from the participants.³⁵²

For the purpose of the present study, as per the JGU PhD guidelines it was imperative that ethical clearance is sought before the research is undertaken. An application for the ethical clearance was submitted with JGU Research and Ethics Review Board, along with the research proposal and questionnaire. The Board after consideration of various aspects of the research project issued an approval.

Since the interviews were conducted over phone, the oral consent of the interviewee was obtained before the questions were asked. In order to ensure that the consent obtained from the participants is meaningful and informed all the participants/interviewees were

³⁴⁹ NATIONAL INSTITUTE OF ENVIRONMENT HEALTH SCIENCES, <https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm?links=false> (last visit May 7, 2021).

³⁵⁰ ETHICAL CONSIDERATIONS, https://www.sagepub.com/sites/default/files/upm-binaries/4999_Polonski_Chapter_5.pdf (last visit May 7, 2021).

³⁵¹ NATIONAL INSTITUTE OF ENVIRONMENT HEALTH SCIENCES, <https://www.niehs.nih.gov/research/resources/bioethics/whatis/index.cfm?links=false> (last visit May 7, 2021).

³⁵² Guthrie, G., *Basic research methods: An entry to social science research*, SAGE Publications India 16 (2010).

apprised of the objective of the study. Also, the information about the project, researcher and the institute that researcher is attached with was conveyed with honesty. They were made aware of the right of opting out of the interview at any point in time. Verbal communication was made regarding the code of ethics. Details about the intended use of the information/survey data were provided. To ensure that the judges are less constrained in their response, they were assured of anonymity. All measures were taken to protect the privacy and anonymity of the participants. Any information that may lead to the identification of the participants was omitted from the data. The nature of the study and the issues involved in the study are such that the participants may feel that their competency as judges is being questioned. To avoid any such unwanted encounter, due care was taken while drafting the survey instrument. It was ensured that the participants are not put in an uncomfortable position.

As regards the doctrinal part, the researcher has tried to maintain utmost integrity and honesty. All the sources from which information is drawn are credible and have been referred to in the footnotes with utmost sincerity. Ethical requirement is to respect the intellectual property rights of the authors.³⁵³ The researcher has maintained utmost honesty in giving due acknowledgement to other people work while citing.

³⁵³ *Id.* at 35.

3.0 COMPARATIVE STUDY OF LAWS IN OTHER COMMON LAW JURISDICTION

No one will deny that the law should in some way effectively use expert knowledge wherever it will aid in settling disputes.....the only question is as to how it can do so best. More than a century later, that question still remains.³⁵⁴

3.1 INTRODUCTION

As has already been spelled out, the present research is a combination of doctrinal and non-doctrinal research. This chapter would present the doctrinal part of the research. It aims to answer the first research question: what are the legal practices for making the gatekeeping function of judges most effective in various jurisdictions? To answer this question, the legal framework of certain common law countries regarding the use and admission of expert evidence in courts was analysed with a special focus on gatekeeping practices. Policymakers in different countries acknowledge the uniqueness of expert evidence in terms of advantages and shortcomings.³⁵⁵ This is evident from the framing of rules specific to the regulation of expert evidence.³⁵⁶ The laws and judicial decisions regulating expert evidence are a source of guidance for judges on how expert evidence is to be assessed. A country's legal framework heavily influences the approach of a judge as gatekeeper. For instance, the Federal Rules of Evidence (U.S.) provide that reliability shall be a condition precedent for the admissibility of expert evidence.³⁵⁷ Whereas in Australia, the law provides that the court's focus shall be on the attainment of specialised knowledge by the expert.³⁵⁸ The judges as gatekeepers are not primarily concerned about

³⁵⁴ Matthew W. Swinehart, *Reliability of Expert Evidence in International Disputes*, 38 MICH. J. INT'L L. 287, 346 (2017).

³⁵⁵ Arnold, Erik and Errol Soriano, *The Recent Evolution of Expert Evidence in Selected Common Law Jurisdictions Around the World: A Commissioned study for the Canadian Institute of Chartered Business Valuators*, Campbell Valuation Partners Ltd. 1 (2013).

³⁵⁶ *Ibid.*

³⁵⁷ Rule 702, Federal Rules of Evidence (USA).

³⁵⁸ Discussed in detail in section 3.2.3 and section 3.2.4 relating to England and Australia respectively.

the reliability of expert evidence for determining the admissibility of expert evidence in Australia. Thus, the evidential legal framework significantly determines how the gatekeeping function is carried out by judges. Examining the legislative framework governing expert evidence is critical for gaining knowledge of the legal practices prevalent in various countries. Apart from specific legislative provisions, it was discovered that jurisprudence concerning expert evidence has evolved via judicial decisions. Those celebrated legal precedents that have achieved the status of legal authority by virtue of being referred in multiple judgments were also analysed. Thus, the study incorporates both statutes and relevant case laws to provide a comprehensive and comparative analysis of the topic.

Comparative research illustrates similarities and dissimilarities between the subjects of the study.³⁵⁹ A comparison with the legal regimes in other nations would demonstrate where India stands compared to other countries. Such a study would help build an understanding of the issue across different systems.³⁶⁰ The study does not imply that India must blindly borrow the rules from other nations. Every nation has different settings and circumstances. The objective is not to mindlessly imitate the practices in other countries. Yet, there is immense scope to judiciously learn from how legal jurisprudence is developing in other nations, especially those with similar legal systems. India's Constitution, which is also referred to as a "bag of borrowings," is a fine example of how the study of the laws of various countries can be a helpful guide. Such a study can help enrich Indian legal scholarship with newer ideas and provide a direction for the laws to develop. Similar comparative studies concerning expert evidence have been undertaken in the past.³⁶¹ To illustrate, a study was commissioned in Canada that compared rules concerning expert evidence in U.K., Australia, Canada, International Arbitration, and U.S.³⁶² The thrust of the study was on Canadian legal practices with the

³⁵⁹ Bukhari, Syed Aftab Hassan, *What is Comparative Study* (November 20, 2011) <https://ssrn.com/abstract=1962328> (last visited 29th Aug. 2022).

³⁶⁰ Coccia, Mario, and Igor Benati, *Comparative studies, Global Encyclopaedia of Public Administration, Public Policy, and Governance—Section Bureaucracy*, Chapter 11 (edited by Ali Farazmand, 2018).

³⁶¹ Arnold, Erik, and Errol Soriano, *The Recent Evolution of Expert Evidence in Selected Common Law Jurisdictions Around the World: A Commissioned study for the Canadian Institute of Chartered Business Valuators*, Campbell Valuation Partners Ltd. (2013); Law Reform Committee, Singapore Academy of Law, *Report of the Law Reform Committee on Opinion Evidence* (October 2011).

³⁶² Arnold, Erik, and Errol Soriano, *The Recent Evolution of Expert Evidence in Selected Common Law Jurisdictions Around the World: A Commissioned study for the Canadian Institute of Chartered Business Valuators*, Campbell Valuation Partners Ltd. (2013).

aim to evaluate these practices in contrast with other jurisdictions that were part of the study. Indian legal system has not been part of any such studies. Thus, the present study is highly significant in evaluating and appreciating the Indian legal practices vis-à-vis other common law jurisdictions.

The countries chosen for this comparative study, on the basis of their legal system, are the United States, England, Australia, Canada, South Africa, and Singapore. The study is premised on the examination of the following resources from each of the above-mentioned countries:

- Statutory rules and regulations governing the use of expert testimony;
- Relevant judicial decisions;
- Secondary legal sources, such as journals, essays, and articles.

3.1.1 GATEKEEPING FUNCTION OF JUDGES – WHAT DOES THE TERM IMPLY?

A “gatekeeper” is the judicial officer who regulates the admission of expert evidence in court.³⁶³ Gatekeeping function of a judge refers to the onerous task of admitting, interpreting, and extracting the probative worth of expert opinions.³⁶⁴ In other words, as a gatekeeper, the judge's role is to ensure that all evidence that are being taken into consideration meet the conditions/requirements of the law. In the case of *Pulp Mills*,³⁶⁵ the International Court of Justice very eloquently articulated the role of a judge as a gatekeeper. The court in the case held that:

It needs only to be mindful of the fact that, despite the volume and complexity of the factual information submitted to it, it is the responsibility of the Court, after having given careful consideration to all the evidence placed before it by the Parties, to determine which facts

³⁶³ *R. v. J. (J-L.)*, (2000) 2 S.C.R. 600, 148 C.C.C. (3d) 487, 37 C.R. (5th) 203, at para. 1; Lisa Dufraimont, *New Challenges for the Gatekeeper: The Evolving Law on Expert Evidence in Criminal Cases*, 58 CRIM. L.Q. 531, 531 (2012).

³⁶⁴ Makane Moïse Mbengue, *Scientific Fact-finding at the International Court of Justice: An Appraisal in the Aftermath of the Whaling Case*, 29 LJIL 529,550 (2016).

³⁶⁵ *Argentina v. Uruguay*, I.C.J. Reports 2010, p. 14.

must be considered relevant, to assess their probative value, and to draw conclusions from them as appropriate.³⁶⁶

Thus, the ultimate authority to admit and weigh (except when there is a jury) the evidence, including expert evidence, lies with the gatekeeping judge. Judges are expected to be vigilant gatekeepers and filter out the charlatan expert evidence.³⁶⁷ This function of the court has also been referred to as admissibility decision making.³⁶⁸ Every country that is part of this study assigns to judges the role of a gatekeeping. Though gatekeeping of evidence includes all types of evidence, the present study focuses on the manner in which gatekeeping of expert evidence is performed. The features specific to each nation have been explained in detail in the section dealing with the laws of these countries individually.

3.2 RULES GOVERNING EXPERT EVIDENCE IN SELECTED COMMON LAW JURISDICTIONS

The primary focus of the present study is to investigate various factors/considerations that determine how expert testimony is evaluated in courts. Specific rules of law governing expert evidence along with other ancillary provisions are instrumental in determining how gatekeeping is performed. For instance, a provision relating to the duty of an expert to be objective and independent in his findings would constrain a judge from admitting expert evidence that is found to be not objective. Thus, a discussion of duties of the expert is very significant for the reason that, in some countries, assessing the ability and willingness of the expert to fulfil his duties towards court is an important part of gatekeeping role of a judge.³⁶⁹ Similarly, a provision relating to appointment of expert by the court would enable to judge to hear a court-appointed expert before deciding on the probative worth of other expert evidences. Thus, these ancillary provisions illuminate on the roles and constraints that a judges must adhere to.

A country wise review of rules has been presented in this section of the chapter. Firstly, the conditions for admission of expert testimony have been identified. Thereafter, there

³⁶⁶ *Id.* para 168.

³⁶⁷ Cynthia H. Cwik, *Guarding the Gate: Expert Evidence Admissibility*, 25 LITIG. 6,66 (1999).

³⁶⁸ Gatowski, Sophia I., et al., *Asking the gatekeepers: A national survey of judges on judging expert evidence in a post-Daubert world*, 25(5) LAW AND HUMAN BEHAVIOR 433-458,454 (2001).

³⁶⁹ *White Burgess Langille Inman v. Abbott and Halburton*, 2015 SCC 23, para 45.

is discussion on gatekeeping role of the court. Lastly, a brief account of duties of an expert and power of court to appoint an expert has been presented.

3.2.1 INDIA

First and foremost, it is necessary to look at the rules concerning expert evidence currently in force in India. It would be much simpler to comprehend and compare the differences between the legal frameworks of India and other nations in this manner. The Indian Evidence Act, 1872 sets forth the rules of evidence for both criminal and civil trials. Section 45 of the Act is the principal section concerning expert testimony. It does not cover every facet of expert evidence. With respect to matters not covered by the provisions of law, guidelines have been framed by way of judicial decisions.

3.2.1.1 ADMISSIBILITY

In India, Expert evidence is admissible if the following conditions are met:

- a. Relevancy – The relevant facts under the Indian Evidence Act, 1872 are restricted to those facts that have been declared relevant by the provisions of the Act.³⁷⁰ Any other fact that may be found relevant on the basis of logic or common sense is not considered relevant. The opinion of an expert has been declared relevant under section 45 of the Act. As per the section, an expert opinion shall be considered relevant when there is a need for the court to refer to an expert to form an opinion on matters requiring expertise. Thus, an expert opinion is relevant only when the judge needs the help of an expert.
- b. Qualification – The terms used in section 45, ‘person specially skilled,’ indicates that it is essential that the expert has undergone a special study or has gained special experience in relation to the subject matter of his testimony.³⁷¹ To put it simply, an expert must be skilled.³⁷² The possession of required skills by the expert is the ethos of his testimony.³⁷³ The skills of the expert shall relate to the subject matter of his testimony.³⁷⁴ For instance, in the case of *State of Himachal Pradesh vs. Jai Lal and others.*,³⁷⁵ the

³⁷⁰ Indian Evidence Act, 1872, s. 5.

³⁷¹ *Ramesh Chandra v. Regency Hospital*, (2009) 9 SCC 709, para 18.

³⁷² *Id.* para 18.

³⁷³ *Dayal Singh v. State of Uttaranchal*, (2012) 8 SCC 263, para 39.

³⁷⁴ *Ramesh Chandra v. Regency Hospital*, (2009) 9 SCC 709, para 16.

³⁷⁵ MANU/SC/0557/1999.

court rejected the testimony of the expert on the ground that the expert did not possess the skills required to assess the productivity of apple trees. The expert failed to show that he has undergone training or had acquired the required skills. It was held that merely because the expert was an officer at the Horticulture Department and, resultantly, might have acquired some related experience was not sufficient to attain the status of an expert.³⁷⁶

c. Subject matter – As already discussed, the necessity to hear an expert is a primary condition for the admissibility of expert evidence. The test to establish necessity is whether the subject matter of the expert opinion is beyond the purview of the knowledge and experience of a common man.³⁷⁷ For instance, in a case involving the determination of a complex issue relating to medical science, hearing a medical expert is necessary.³⁷⁸ Thus, the subject matter of expert opinion must be such that a person with ordinary knowledge and experience cannot comprehend it.

d. The necessity to hear the expert in person – Numerous judgments of the High Courts and the Supreme Court has held that no reliance can be placed on the testimony of an expert unless the expert testifies in court.³⁷⁹ The report of an expert does not go in evidence automatically.³⁸⁰ The expert has to be examined and cross-examined in court for the evidence to be admissible.³⁸¹ This requirement gives the other party an opportunity to cross-examine the expert and helps that court assess the credibility of the expert opinion. There are exceptions to this requirement:

- i) Under section 293 of the Criminal Procedure Code, 1973, certain classes of government scientific experts are exempt from the necessity to testify in person in court,
- ii) When the expert opinion has already been admitted by a lower court,
- iii) When the opinion of the expert is expressed in the treatise,

³⁷⁶ *Id.* para 20.

³⁷⁷ *Ramesh Chandra v. Regency Hospital*, (2009) 9 SCC 709, para 16.

³⁷⁸ *Id.* para 15.

³⁷⁹ *Ramesh, State of Maharashtra v. Damu S/o Gopinath Shinde and Ors.*, AIR 2000 SC 1691.

³⁸⁰ *State of H.P. v. Jai Lal and ors.*, (1999) 7 SCC 280, para 19.

³⁸¹ *Id.* para 19.

iv) When it is not feasible to call the expert to court.³⁸²

e. Reliable – The last and the most important condition for admission of evidence is that it shall be based on reliable principles in order to be admitted in the court.³⁸³ Expert testimony/evidence that is not based on reliable scientific principles shall not be admitted in court. A detailed account of how reliability affects admissibility has been provided for in the following section.

3.2.1.2 GATEKEEPING FUNCTION

Gatekeeping of evidence is a well-recognised duty of a judge in India. The Supreme Court of India and the High courts have time and again recognised the gatekeeping role of a judge.³⁸⁴ An expert testifying in court assists the court with his specialised knowledge. But an expert does not make a judicial determination.³⁸⁵ He only deposes in court his opinion.³⁸⁶ The authority to determine the issues and give a final verdict lies within the jurisdiction or judicial authority of the court. Opinions rendered by an expert in courts are not beyond the scope of judicial review.³⁸⁷ The court has the authority to override the opinion of an expert if there is a reasonable ground to do so. Before relying on an expert opinion, the court shall come to an independent judgment concerning the subject matter of the expert opinion with the help of the reasoning and material provided by the expert.³⁸⁸ It lies in the domain of the authority of court to determine if the opinion of the expert shall be admitted and how much weight it deserves.³⁸⁹

Further, as a rule of prudence, expert evidence is considered as advisory or secondary evidence.³⁹⁰ The rule is based on the premise that experts are not witnesses of facts and expert evidence are merely opinions. Further, to err is human, and all human judgments are susceptible to making mistakes. Thus, an expert may make an error of observation

³⁸² Arindam Datta, *Forensic Evidence: The Legal Scenario*, LEGAL SERVICE INDIA (Feb. 1st, 2022), <http://www.legalserviceindia.com/article/1153-ForensicEvidence.html>.s (last visited 29th Aug. 2022).

³⁸³ *Ramesh Chandra v. Regency Hospital*, (2009) 9 SCC 709, para 16.

³⁸⁴ *Ranjitsing Brahmajetsing Sharma v. State of Maharashtra*, AIR 2005 SC 2277; *Nnadi K. Iheanyi v. Narcotics Control Bureau*, CRL. A. 1416 of 2010, Delhi HC.

³⁸⁵ *Murari Lal v. State of M.P.*, (1980) 1 SCC 704.

³⁸⁶ *Ibid.*

³⁸⁷ Ratanlal Ranchhoddas, Dhirajlal Keshavlal Thakore, *The Law of Evidence* 750,755 (23rd ed. 2010).

³⁸⁸ *Murari Lal v. State of M.P.*, (1980) 1 SCC 704.

³⁸⁹ *Malay Kumar Ganguly v. Sukumar Mukherjee*, (2009) 9 SCC 221.

³⁹⁰ *State of Karnataka v. J. Jayalalitha*, (2017) 6 SCC 263, para 254.

or some other unintentional mistake. Hence, it is safe to not rely completely on opinion evidence without corroboration.³⁹¹ The more advanced the science or technique, the less are the chances of mistakes.³⁹² Hence, corroboration would not always be sought for.³⁹³ Depending on the facts of the case, the reliability of the technique involved, and other such factors, the court may seek corroboration to a varying degree. Thus, there is no fixed rule requiring corroboration of expert evidence in all cases.³⁹⁴ The courts are not justified in rejecting expert evidence only because there is no other evidence for corroboration.³⁹⁵ The totality of the circumstances shall be seen to determine whether corroboration shall be sought for in a particular case.

Overall, the approach of the court toward expert evidence shall be cautionary.³⁹⁶ The court shall fully satisfy itself of the truthfulness and reliability of the expert evidence before relying on it.³⁹⁷ The reliability or credibility of the expert opinion is dependent on the reasons and material supporting the opinion.³⁹⁸ An unreasoned expert opinion is worthless.³⁹⁹ These principles/techniques on which the forensic evidence is based should be shown to be trustworthy by the expert testifying in court. The same has been reiterated by the Sikkim High Court (2018) in the case of *Anish Rai v. State of Sikkim*.⁴⁰⁰ The court, in the case, has held that the grounds on which the expert opinion is based shall be assessed carefully.⁴⁰¹ The honourable court said that expert opinion deserves due consideration, yet this is not to say that the opinion so given by an expert is always binding on the courts. In fact, an opinion given by an expert in court without elaborating on the basis of his opinion would be of no value to the case. In this case, an expert gave evidence about the age of a person using the x-ray method. This court said that X-ray certainly gives information about the stage of fusion of the bones in the body of a person, but this much information in itself is not enough for the court to reach any conclusion

³⁹¹ *Chennadi Jalapathi Reddy v. Baddam Pratapa Reddy*, (2019) 14 SCC 220; *Ram Chandra v. State of U.P.*, AIR 1957 SC 381; *Shashi Kumar Banerjee v. Subodh Kumar Banerjee*, AIR 1964 SC 529; *Magan Bihari Lal v. State of Punjab*, 1977 SCC (Cri) 313.

³⁹² *Murari Lal v. State of M.P.*, (1980) 1 SCC 704.

³⁹³ *Ibid.*

³⁹⁴ *Ibid.*

³⁹⁵ *Ibid.*

³⁹⁶ *Chennadi Jalapathi Reddy v. Baddam Pratapa Reddy*, (2019) 14 SCC 220.

³⁹⁷ *Kanchan Singh Dholaksingh Thakur v. State of Gujarat*, (1979) 4 SCC 599.

³⁹⁸ *Malay Kumar Ganguly v. Sukumar Mukherjee*, (2009) 9 SCC 221.

³⁹⁹ *Hazi Mohammed Ikramul Hague v. State of West Bengal*, AIR 1959 SC 488.

⁴⁰⁰ *Anish Rai v. State of Sikkim*, 2018 SCC OnLine Sikk 141.

⁴⁰¹ *Id.* para 15.

concerning the age of the person. The court held that the expert 'ought to have clarified and elaborated on what the various stages of fusion of bone signified and how consequently she has reached her finding of the bone age of the victim to enable the court to reach a decision with clarity and to appreciate her efforts.'⁴⁰² Thus, the discretion and authority to examine the veracity of an expert's averments lie with the presiding judge.⁴⁰³

The courts in India have repeatedly held that gatekeeping is a very crucial role of trial judges. After all, a trial is nothing but a search for the truth, and the trial court shall play a very crucial role in eliciting the truth.⁴⁰⁴ An opinion of an expert is just an opinion, and the court is free to not accept it. The court has to proactively satisfy itself of the reasoning behind the opinion.⁴⁰⁵ In other words, the judge shall form an independent opinion as to the accuracy of the conclusions drawn by the expert based on his testimony.⁴⁰⁶ Whenever law makes an expert opinion part of the decisions, it does it at its own risk.⁴⁰⁷ This is particularly why there is a special difficulty in dealing with the evidence of expert witnesses. Such evidence has to be received with great caution and care.⁴⁰⁸ Especially because the opinion of an expert, once accepted, becomes the opinion of the court.⁴⁰⁹ Expert opinion that is lacking in objectivity or logic ought to be discarded by the court.⁴¹⁰ Expert opinion that merely asserts conclusions without providing the data in support makes the opinion worthless. As a result, though an unreasoned opinion may be admitted in court, it shall not be considered at the time of weighing evidence.⁴¹¹

An instance of proactive gatekeeping by the appellate court and laxity in the approach of the trial judge was observed in the case of *Nnadi K. Iheanyi v. Narcotics Control Bureau*.⁴¹² In this case, the opinion of an expert was discarded for want of reliable

⁴⁰² *Id.* para 15.

⁴⁰³ Setia H, *Evidentiary Value of Forensic Reports in Indian Courts* 5 (2016).

⁴⁰⁴ *State of Uttarakhand v. Akhtar Ali*, MANU/UC/0918/2019.

⁴⁰⁵ *Sushil Sharma S/o Late Kharananda Sharma v State of Sikkim*, 2018 Indlaw SIK 93.

⁴⁰⁶ *State of Himachal Pradesh vs. Jai Lal and Ors.*, MANU/SC/0557/1999.

⁴⁰⁷ Onstott, C., *Judicial Notice and the Law's Scientific Search for Truth*, (40) Akron L. Rev. 465 (2007).

⁴⁰⁸ 1 SARKAR, *LAW OF EVIDENCE*, 1052 (16th ed. 2007).

⁴⁰⁹ *Madan Gopal Kakkad vs. Naval Dubey and Ors.*, MANU/SC/0509/1992.

⁴¹⁰ *Gangabhavani v. Rayapati Venkat Reddy*, (2013) 15 SCC 298, para 11.

⁴¹¹ *The State (Delhi Administration) v. Pali Ram*, AIR 1979 SC 14.

⁴¹² CRL. A. 1416 of 2010, Delhi HC.

reasoning. The case involved examination of heroin by Central Revenue Control Laboratory that was allegedly recovered from the accused. The trial court found that there was a discrepancy in purity percentage and constituents of the sample drawn at the time of arrest and at the time of trial (three years after the incident). Yet, the trial court ruled out any possibility of contamination or tampering with evidence and held that the changes were on account of natural decomposition, the effect of light, high temperature, and humidity. On appeal, the High Court of Delhi, after extensive cross-examination and review of literature, held that the explanation for changes in the constituents of two samples is not scientific. The High Court held that the answers given by the expert in the cross-examination were non-scientific and, therefore, the expert opinion was not reliable. Thus the court overturned the trial court verdict. The court summed up the judgments with a brief note on the significance of the gatekeeping role of a trial judge, which involves screening of evidence for not only relevance but also reliability.⁴¹³ This case aptly illustrates the role of a judge with respect to expert evidence.

The issue of assessing the reliability of techniques used by experts is significant and often arises before courts. The standard of proof expected from forensic expert depends on the nature of the science. Unfortunately, on the issue of standard of proof of reliability, there are no statutory guidelines in the Indian legal framework. The High Court of Uttarakhand in the case of *State of Uttarakhand v. Akhtar Ali*,⁴¹⁴ while dealing with the issue of how much the court should probe the expert's evidence noted that unlike U.S. there are no rules/guidelines for accepting expert evidence.⁴¹⁵ Various High Courts and the Supreme Court have resorted to the revolutionary judgment of Supreme Court of U.S., *Daubert v. Merrell Dow Pharmaceuticals, Inc.*⁴¹⁶ for assistance in this regard.⁴¹⁷ The Daubert judgment has laid down parameters that could be used to determine the reliability of a technique.⁴¹⁸ The most significant point to be noted here is that reference to Daubert by the courts in India has been meaningless. There has not been actual implementation of

⁴¹³ *Id.* para 47.

⁴¹⁴ MANU/UC/0918/2019.

⁴¹⁵ *Id.* para 76.

⁴¹⁶ 509 U.S. 579 (1993).

⁴¹⁷ *Mukesh and another Vs. State (NCT of Delhi) and others*, (2017) 6 SCC 1; *Dharam Dev Yadav v. State of UP*, 2014 (86) ACC 293 (SC); *Harjinder Kaur v. State of Punjab*, 2013(2) RCR (Criminal)146 (P&H HC); *Rajli v. Kapoor Singh*, (2014)174(2) PLR 575 (P&H HC).

⁴¹⁸ This judgment has been discussed in detail in the following section 3.2.2.

Daubert in essence. None of the cases, where Daubert has been referred, have applied or considered Daubert factors.

3.2.1.3 DUTIES OF AN EXPERT

An expert is not free to depose in court in whatsoever manner he likes. There are duties imposed on an expert who comes to court with an expert opinion/report. Every expert is duty-bound to present to the court as part of his testimony the necessary reasoning or scientific criteria which form the basis of his findings. This would help the judge independently assess the application of technique, and the worthiness of the conclusions arrived at by the expert.⁴¹⁹ The soundness of an expert witness report depends on the soundness of the supporting reasoning, data, and material provided by the expert.⁴²⁰ Thus it is a prime duty of an expert to provide the court with reasoning that forms the foundation for the expert opinion.

Further, the basis of an expert report shall be objectivity and openness to truth.⁴²¹ This implies that an expert's duty is to present a truthful, objective and unbiased opinion before the court. He shall not get swayed by the interest of the party calling him to the court. The court has the authority to initiate criminal proceeding⁴²² against an expert if he is found to have deliberately deposed falsely in order to help an accused.⁴²³ These duties of an expert have not been laid down in statutes. They have emerged by way of judicial decisions.

3.2.1.4 COURT-APPOINTED EXPERT

The general practice followed in courts in India is that the parties hire and summon experts in court.⁴²⁴ The law does not provide a specific and explicit provision for the appointment of an expert by the court. Yet, the same can be done by virtue of implied powers of the court provided by section 165 of the Indian Evidence Act, 1872. This section gives immense discretion to the court to call anyone as a witness and examine him if it is required for the just decision of the case.⁴²⁵ The section provides that the trial

⁴¹⁹ *State of H.P. v. Jai Lal and Ors.*, (1999) 7 SCC 280, para 13.

⁴²⁰ *Id.* para 13.

⁴²¹ *Prem Sagar Manocha v. State (NCT of Delhi)*, (2016) 4 SCC 571, para 20.

⁴²² Criminal proceedings here refer to prosecution for the offence of perjury under section 193 of the Indian Penal Code, 1861.

⁴²³ *Prem Sagar Manocha v. State (NCT of Delhi)*, (2016) 4 SCC 571, para 20.

⁴²⁴ See section 5.6.3.

⁴²⁵ *State (Delhi Admin.) v. Pali Ram*, (1979) 2 SCC 158.

court may ‘put any question, in any form, at any time.’⁴²⁶ The use of the term ‘any’ indicates the legislative intent to confer unrestricted power to a court to be used whenever necessary for the cause of justice.⁴²⁷ The scope of the court’s power under this section is broad, and no party can object to the use of this power by the court.⁴²⁸ The section also serves as a reminder to the court about its duty to explore all possible means to discover the truth and uphold the cause of justice.⁴²⁹

3.2.2 UNITED STATES (U.S.)

United States is a forerunner in the evolution of evidentiary jurisprudence on expert evidence. The *Daubert* judgment⁴³⁰ of the Supreme Court of U.S. relating to expert evidence and gatekeeping functions has been adopted by numerous countries, including India. This is a prime reason why this comparative study starts with analysing laws and rules in the U.S. The principal rule governing expert testimony in the U.S. is Rule 702 of the Federal Rules of Evidence (FRE). It lays down the conditions for the admission of expert evidence in court. It states that:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

Rule 702 in its present form is the result of the amendment made to this rule in 2000. This amendment is a statutory manifestation of the *Daubert* trilogy.⁴³¹ *Daubert*, along with the two other landmark cases, has come to be known as the

⁴²⁶ *State of Rajasthan v. Ani Alias Hanif and other*, (1997) 6 SCC 162, para 11.

⁴²⁷ *Id.* para 11.

⁴²⁸ *Manish Dixit v. State of Rajasthan*, (2001) 1 SCC 596, para 40.

⁴²⁹ *Sessions Judge Nellore v. Intha Ramana Reddy*, 1972 CriLJ 1485.

⁴³⁰ The judgment has been dealt with in detail in section 1.3 of chapter 1.

⁴³¹ Gary Edmond, Simon Cole, Emma Cunliffe & Andrew Roberts, *Admissibility Compared: The Reception of Incriminating Expert Evidence (I.E., Forensic Science) in Four Adversarial Jurisdictions*, 3 U. Denv. Crim. L. Rev. 31, 39 (2013).

Daubert trilogy. The other two cases are *Joiner* and *Kumho*. The cases have been discussed in detail in section 1.3 of chapter 1.

3.2.2.1 ADMISSIBILITY

As is clear from rule 702, the following conditions must be satisfied for the admission of expert evidence in court.

a. Relevancy – All relevant evidence are admissible in court unless they are excluded by virtue of any exclusionary rule or judicial decisions.⁴³² Thus, relevant expert evidence may be admitted in court as an opinion evidence. The standard of relevance required to admit evidence is liberal.⁴³³ Rule 401 of the Federal Rules of Evidence defines relevancy as the ability of evidence to add to the probability of the existence or nonexistence of a fact. Hence, expert evidence that has the probative capacity to prove the existence or nonexistence of a fact is relevant evidence provided it does not come within the purview of an exclusionary rule, such as rule 403 which provides that the court may refuse to admit evidence that may lead to confusion, delay, or prejudice. Resultantly, relevant expert evidence may be excluded if it has the tendency to cause delay, confusion, or prejudice.

b. Expertise - Rule 702 is wide in scope. It says “a witness who is qualified as an expert by knowledge, skill, experience, training or education.” Accordingly, the manner in which one may attain expertise is not confined to education or qualification. A person may qualify as an expert even on the basis of knowledge gained by way of experience or training that is not part of formal education.⁴³⁴ If the witness relies substantially on experience, then the witness must explain how that experience has resulted in attaining expertise.⁴³⁵ Similarly, the rule is wide even with respect to the areas of knowledge that an expert may belong to. All fields of knowledge that are "scientific" and "technical" are included as "specialised" information.⁴³⁶ Hence, the rule encompasses not just experts in the strictest sense, such as doctors, physicists, and architects, but also a wide range of

⁴³² FED. R. EVID. Rule 402.

⁴³³ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

⁴³⁴ 107 F.3d 1147 (6th Cir. 1997).

⁴³⁵ LEGAL INFO. INST., https://www.law.cornell.edu/rules/fre/rule_702 (last visited Sept. 4th, 2021).

⁴³⁶ *Ibid.*

individuals often referred to as "skilled" witnesses, such as bankers or landowners testifying about property prices.⁴³⁷

c. Helpfulness – Rule 702 (a) categorically states that an opinion may be presented in court if it is helpful to the court. This condition has a direct relation with the relevancy of the evidence.⁴³⁸ If the link between the expert evidence and the dispute facts in issue is weak, it would be excluded from evidence.⁴³⁹ The term ‘help’ used in the rule refers to a valid scientific connection with the facts in issue.⁴⁴⁰ Thus only that expert evidence are admitted that would be helpful in the determination of the case.

d. Reliability - Reliability of expert evidence has a special place in U.S. evidentiary jurisprudence. The overriding criterion of reliability is laid out in Rule 702. This is a unique feature of these rules. The requirement of ‘reliability’ was made explicit by the 2000 amendment to Rule 702.⁴⁴¹ Standard of reliability of expert evidence has been a subject matter of extensive debate in the U.S. A detailed analysis of standards of reliability as a condition for the admissibility of evidence has been presented in the following section.

3.2.2.2 GATEKEEPING FUNCTION

It is trite to mention that the U.S. legal system has a jury.⁴⁴² This feature of the U.S. legal system sets it apart from the Indian legal system, though the two legal systems have certain other common features, such as an adversarial legal system and gatekeeping responsibility of judges.⁴⁴³ The Supreme Court, in the iconic case of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,⁴⁴⁴ has held that the trial court is responsible for the “assessment of whether the reasoning or scientific methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.” Judges have adopted innovative and flexible

⁴³⁷ *Ibid.*

⁴³⁸ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

⁴³⁹ *United States v. Downing*, 753 F.2d 1224, 1242 (CA3 1985)

⁴⁴⁰ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

⁴⁴¹ Gary Edmond, Simon Cole, Emma Cunliffe & Andrew Roberts, *Admissibility Compared: The Reception of Incriminating Expert Evidence (I.E., Forensic Science) in Four Adversarial Jurisdictions*, 3 U. Denv. Crim. L. Rev. 31, 39 (2013).

⁴⁴² UNITED STATES COURTS, FEDERAL COURTS AND THE PUBLIC, <https://www.uscourts.gov/about-federal-courts/federal-courts-public> (last visited 31st Aug, 2022).

⁴⁴³ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

⁴⁴⁴ 509 U.S. 579 (1993).

approaches as gatekeepers.⁴⁴⁵ A request to exclude expert evidence from being presented to the jury is raised through a motion called the *Daubert* motion. For instance, in the case of *U.S.A v. Oracle Corp.*⁴⁴⁶ a *Daubert* motion was raised to exclude the expert testimony of defendant's expert on the ground that he did not have the required qualification, his testimony would not be helpful in the determination of the case, and he had not applied a specified methodology that would form the basis of his testimony.⁴⁴⁷ Resultantly, the court in the *Daubert* motion excluded the expert testimony.⁴⁴⁸

The majority in the *Daubert* judgment strongly emphasised on reliability as a condition for admissibility.⁴⁴⁹ Also, reliability has statutorily become a condition precedent for the admission of expert evidence since the amendment to rule 702 in 2000. Further expert evidence that does not provide information on the data on which the conclusions were based or the methodology involved is not admissible.⁴⁵⁰ The reason for excluding such evidence is that it lacks the required information based on which reliability can be assessed.⁴⁵¹ Also, it is likely to mislead jury.⁴⁵² In the case of *Zenith Elecs. Corp. v. WH-TV Broad. Corp.*,⁴⁵³ an expert witness proposed to testify about the estimate of the sales by a broadcasting company had there been delivery of a certain type of boxes by the supplier. The court inquired about the statistical tool or market data that was used to form the expert opinion. The expert failed to provide information regarding a specific method, he rather testified in terms such as "as per my industry expertise, my curriculum vitae, my awareness." The court questioned the reliability of the expert evidence as it was not based on any statistical tool or econometric means. The expert evidence was rejected, and the court held that "nothing in either *Daubert* or the Federal Rules of

⁴⁴⁵ *Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 736, 739 (3d Cir. 1994); *Claar v. Burlington N.R.R.*, 29 F.3d 499, 502–05 (9th Cir. 1994).

⁴⁴⁶ U.S. Department of Justice, <https://www.justice.gov/atr/case-document/plaintiffs-daubert-motion-exclude-certain-opinion-testimony-dale-kutnick> (last visited 31st Aug, 2022).

⁴⁴⁷ *Ibid.*

⁴⁴⁸ *Ibid.*

⁴⁴⁹ Gary Edmond, *Deflating Daubert: Kumho Tire Co. v. Carmichael and the Inevitability of General Acceptance (FRYE)*, 23 U.N.S.W.L.J. 38, 39 (2000).

⁴⁵⁰ *United States v. Downing*, 753 F.2d 1224, 1242 (CA3 1985).

⁴⁵¹ *United States v. Downing*, 753 F.2d 1224, 1242 (CA3 1985).

⁴⁵² *United States v. Downing*, 753 F.2d 1224, 1242 (CA3 1985).

⁴⁵³ 395 F.3d 416, 419 (7th Cir. 2005) (Easterbrook, J.)

Evidence requires a district court to admit opinion evidence which is connected to existing data only by the *ipse dixit*⁴⁵⁴ of the expert.”

Two standards of assessing the reliability of expert evidence are prevalent in the U.S. One is *Daubert* standards and the other is *Frye* or *general acceptance* standard. The ‘*general acceptance*’ test, laid down in the *Frye v. US*,⁴⁵⁵ determined the reliability of expert testimony for a long time in both state and federal courts, especially in relation to novel techniques. As per this landmark judgment, only those techniques or principles that had attained a certain level of acceptance among the relevant community could be admitted in courts.⁴⁵⁶ The court, in this judgment, distinguished between scientific and legal reliability. By requiring approval by the relevant scientific community, the *Frye* judgment acknowledged that evaluating scientific credibility within a scientific area is distinct from evaluating scientific reliability within a judicial context.⁴⁵⁷

Fascinatingly, a new standard or test of reliability came into being in the year 1993 in the ruling of the U.S. Supreme Court in the case of *Daubert v Merrell Dow Pharmaceuticals Inc.*⁴⁵⁸ The U.S. Supreme Court in *Daubert* identified four non-definitive parameters for testing the reliability of an expert testimony.⁴⁵⁹

The court gave these factors, which came to be known as the *Daubert* factors, by way of illustration and are not meant to be exhaustive in nature. This assessment of the scientific validity of the proffered evidence is meant to be flexible.⁴⁶⁰ In other words, any such inquiry is not bound by the four factors that were explicitly mentioned in the case. It requires that the judge shall delve into the scientific field concerned and examine its reliability accordingly to the nature of the technique involved.⁴⁶¹

⁴⁵⁴ It means the only proof we have of the fact is that this person said it, <https://dictionary.law.com/Default.aspx?typed=ipse%20dixit&type=1> (last visited 31st Aug, 2022).

⁴⁵⁵ 293 F 1013 (1923).

⁴⁵⁶ *Ibid.*

⁴⁵⁷ Dinkar, V. R., *Interpreting scientific expert evidence with special emphasis on the admissibility and probative value of DNA identification evidence* 47 (2005) <http://hdl.handle.net/10603/6648> (last visited 29th Aug. 2022).

⁴⁵⁸ 509 US 579 (1993).

⁴⁵⁹ See Section 1.3 of Chapter 1.

⁴⁶⁰ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

⁴⁶¹ Boaz Sangero & Mordechai Halpert, *Scientific Evidence v. “Junk Science,”* 11 C.L.B. L.STUD. 425, 431 (2014) (Isr.).

Presently, Rule 702 and the *Daubert* trilogy serve as the principal guide for the assessment of scientific validity for courts in the Supreme Court of the U.S. and also in around 16 states.⁴⁶² Some states prefer to follow the *Frye* judgment.⁴⁶³ And, some states adopt a hybrid approach that includes the use of both *Daubert* and *Frye* standards.⁴⁶⁴ Empirical studies demonstrate that the admissibility of expert evidence is not much impacted by the use of different standards.⁴⁶⁵ States using either *Daubert* or *Frye* standards have some shown similar outcomes.⁴⁶⁶

It would be interesting to analyse, with the help of cases, how the *Daubert* factors are applied in practice in courts. In the case of *Ruffin v. Shaw Indus., Inc.*,⁴⁶⁷ the expert witness testified to show that the use of a particular quality of carpet led to toxic respiratory injuries. The methodology used by the expert involved placing and heating in a glass chamber a small section of the carpet. Four mice were exposed to the air from this chamber. Certain respiratory and pulmonary defects were noticed in the mice. The testimony was challenged based on *Daubert* standards. Firstly, the methodology was tested for replicability. It was found that none of the public or private organisations was able to replicate the results using this method. As regards peer review, the court, after going through the critics of the methodology, concluded that the scientific community is not supportive of this methodology. Further, based on testimony of other toxicologists, the court concluded that there is no general acceptance of this methodology among the community of toxicologists. Lastly and most importantly, the court tested the methodology based on factors other than the four factors explicitly mentioned in the *Daubert* judgment. The court remarked that the expert's method did not conform with the protocol established by the American Society for Testing and Materials.⁴⁶⁸ Also, the test involved subjective analysis by an unqualified expert who was not blinded to the subjects of the test, i.e., the expert had prior knowledge of the subjects. Therefore, the test might involve the risk of subjective observations. Keeping in mind these facts, the

⁴⁶² Gary Edmond, Simon Cole, Emma Cunliffe & Andrew Roberts, *Admissibility Compared: The Reception of Incriminating Expert Evidence (I.E., Forensic Science) in Four Adversarial Jurisdictions*, 3 U. Denv. Crim. L. Rev. 31, 39 (2013).

⁴⁶³ *Ibid.*

⁴⁶⁴ *Id.* at 40.

⁴⁶⁵ Lloyd Dixon & Brian Gill, *Changes in the Standards for Admitting Expert Evidence in Federal Civil Cases Since the Daubert Decision*, 8 PSYCHOL. PUB. POL'Y & L. 251, 252, 285-86 (2002).

⁴⁶⁶ *Ibid.*

⁴⁶⁷ 149 F.3d 294, 297-99 (4th Cir. 1998).

⁴⁶⁸ *Id.* at para 4.

testimony of the expert was held to be unreliable and, therefore, not admissible. It is interesting to know how systematically the threadbare analysis of the expert method was carried out. The reliability of the method was tested against several parameters separately and distinctively. This manner of enquiry into the reliability of expert testimony is a peculiar feature of the *Daubert* motion. Adoption of *Daubert* has led to a remarkable decrease in the admission of expert evidence without adequate scrutiny.⁴⁶⁹

3.2.2.3 DUTIES OF THE EXPERT

The Federal Rules of Evidence do not contain a code of conduct for experts and do not explicitly describe the expert's responsibility to the court.⁴⁷⁰ The only requirement of the law in relation to civil matters is that the report of an expert shall provide information about his qualification, publications, previous testimonies, reasoning in support of his opinion and remuneration received from the party that hired him.⁴⁷¹ A similar provision is found in the Federal Rules of Criminal Procedure for criminal cases.⁴⁷²

Federal courts do not require that the expert must act independently and objectively. In fact, a party can itself testify as an expert in his own case.⁴⁷³ The issue of bias or impartiality in the opinion of an expert is considered at the stage of weighing the evidence.⁴⁷⁴ These issues do not come in the way of admissibility of the expert evidence. Though, it has been observed that the issue of biasness in expert reports has imposed a heavy burden on judges to cull out a reliable conclusion from ridiculously biased expert reports.⁴⁷⁵

⁴⁶⁹ Krafka, C., Dunn, M.A., Johnson, M.T., Cecil, J.S. and Miletich, D., *Judge and attorney experiences, practices, and concerns regarding expert testimony in federal civil trials*, 8(3) Psychology, Public Policy, and Law 309 (2002).

⁴⁷⁰ Arnold, Erik, and Errol Soriano, *The Recent Evolution of Expert Evidence in Selected Common Law Jurisdictions Around the World: A Commissioned study for the Canadian Institute of Chartered Business Valuators*, Campbell Valuation Partners Limited 5 (2013).

⁴⁷¹ Federal Rules of Civil Procedure, Rule 26 (2) (B) (vi).

⁴⁷² Federal Rules of Criminal Procedure, Rule 16 (a) (1) G.

⁴⁷³ *Rodriguez v. Pacificare of Texas, Inc.*, 980 F.2d 1014 (5th Cir. 1993), at p. 1019; *Tagatz v. Marquette University*, 861 F.2d 1040 (7th Cir. 1988); *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286 (Fed. Cir. 2014), at p. 1321.

⁴⁷⁴ CORPUS JURIS SECUNDUM, vol. 32 (2008), p. 325.

⁴⁷⁵ *Ibid.*

3.2.2.4 COURT-APPOINTED EXPERT

The U.S. courts have the inherent as well as explicit power to appoint experts.⁴⁷⁶ Rule 706 of the Federal Rules of Evidence enables the courts to, on their own volition, appoint an expert for assistance. Yet, this power is hardly ever exercised.⁴⁷⁷ The possibility that a court may select an expert witness in a particular case is expected to have a sobering impact on the expert witness and the parties to the case.⁴⁷⁸

3.2.2.5 TAKE AWAY POINTS

The landmark *Daubert* judgment has already been adopted in India by way of judicial decisions. It is found that *Daubert* has been quoted with approval by the Supreme Court of India and several High Courts.⁴⁷⁹ Yet, it ought to be appreciated that mere reference or enumeration of *Daubert* factors does not suffice. In order to adopt these standards of determining reliability, in the truest sense, the courts need to adopt the standards in actual practice. None of the Indian cases that have referred to *Daubert* Judgment have applied actually *Daubert* factors. There is a mere reiteration of the judges without an actual application of the reliability standards, as is seen in the case of the *Daubert* motion. The courts in India refer to scientific literature to assess the reliability of expert reports, but such reference is not systematic and parameter based.

Further, it is important to note that the legislation in the U.S. has incorporated the essence of the *Daubert* judgment in the form of statute, i.e., rule 702. By way of amendment in the year 2000, Rule 702 was amended to give effect to the ratio of the *Daubert* judgment statutorily. Hence, the reliability of forensic techniques was turned into a statutory requirement for the admission of expert. The amendment gave a formal expression to the requirement of reliability.⁴⁸⁰ Another effect of the amendment was that the

⁴⁷⁶ *Scott v. Spanjer Bros., Inc.*, 298 F.2d 928 (2d Cir. 1962); *Danville Tobacco Assn. v. Bryant-Buckner Associates, Inc.*, 333 F.2d 202 (4th Cir. 1964).

⁴⁷⁷ M. Saks, *The Phantom of the Courthouse*, 35 *Jurimetrics* 233 (1995); J. Cecil and T. Willging, *Court-Appointed Experts: Defining the Role of Experts Appointed under the Federal Rule of Evidence 706* (Federal Judicial Center: Washington DC, 1993).

⁴⁷⁸ CORNELL LAW SCHOOL, https://www.law.cornell.edu/rules/fre/rule_702 (last visited Sept. 4th, 2021).

⁴⁷⁹ *Mukesh and another Vs. State (NCT of Delhi) and others*, (2017) 6 SCC 1; *Dharam Dev Yadav v. State of UP*, 2014 (86) ACC 293 (SC); *Harjinder Kaur v. State of Punjab*, 2013(2) RCR (Criminal)146 (P&H HC); *Rajli v. Kapoor Singh*, (2014)174(2) PLR 575 (P&H HC).

⁴⁸⁰ Mueller, Christopher B., Laird C. Kirkpatrick, and Liesa Richter, § 7.7 *Reliability Standard (Daubert, Frye)*, C. Mueller, L. Kirkpatrick, & L. Richter, *Evidence* 7 (2018).

gatekeeping function of a judge was incorporated in categorical terms in the Federal Rules of Evidence itself.⁴⁸¹

Furthermore, rule 403 of the Federal Rules of Evidence expressly gives the court discretion to exclude evidence that may lead to unfair prejudice, confusion, delay, etc. Express provision for the court-appointed experts is also part of the legal framework.⁴⁸² The amendment to rule 702 was enacted with a view that a change in the statute may put the spotlight on the need for the reliability of expert evidence. It was a laudatory measure. Similar amendments in the Indian evidentiary law to explicitly and statutorily mandate the gatekeeping function and the screening of the expert evidence for reliability shall be introduced. Further, other provisions such as Rule 403 (discretionary power of court) and Rule 706 (appointment of expert by the court) also ought to be incorporated in the evidence law in India.

Statutory changes and enactments have a major impact on the understanding and implementation of law. It is precisely for this reason that a further amendment is proposed to be introduced to rule 702. The proposed changes are nothing new but an express manifestation of existing requirements of law.⁴⁸³ It is believed that by way of these amendments, the court would be constraint from evading its duty to assess forensic evidence for reliability. It has been observed that few trial courts have been admitting expert evidence while leaving the issue of reliability to be decided by the jury. The report of the advisory committee on Evidence Rules in the meeting concerning the amendment to rule 702 observed that “the language as added to emphasize the gatekeeper function because some courts were delegating matters to the jury that the court must resolve itself.”⁴⁸⁴ This is a blatant disregard of rules 702 and rule 104(a)⁴⁸⁵ of the Federal Rules of Evidence. Hence, to overcome this difficulty, it is proposed that the requirement to assess the reliability of expert evidence shall be clarified. The amendment does not

⁴⁸¹ *Ibid.*

⁴⁸² Federal Rule of Evidence 706.

⁴⁸³ JDSUPRA, Proposed Amended FRE 702 Confirms Court as Gatekeeper of Expert Testimony (18th April, 2022) <https://www.jdsupra.com/legalnews/proposed-amended-fre-702-confirms-court-2742255/> (last visited 31st Aug. 2022).

⁴⁸⁴ Advisory Committee on Evidence Rules, Minutes of the Meeting of April 30, 2021 Via Microsoft Teams, page 3, uscourts.gov/sites/default/files/ev_minutes_spring_2021_0.pdf (last visited 31st Aug. 2022).

⁴⁸⁵ The court must decide any preliminary question about whether a witness is qualified, a privilege exists, or evidence is admissible.

provide for anything new. It is merely a clarification of the present state of law.⁴⁸⁶ Crystallisation of a rule in the form of statutory provisions is believed to a significant impact on its implementation. It diminishes the possibility of a judge or expert escaping their legal obligations. This regular upgradation of law on admissibility of expert evidence in the U.S. shall serve as a guiding light for the legislators in India.

3.2.3 ENGLAND

The common law system of England has a unique relevance to Indian law since the Indian legal system is a direct descendant of the British legal system.⁴⁸⁷ The presence of a jury system in the legal system in England does not make much of a difference as a judge or jury may have the same problems with expert testimony.⁴⁸⁸

3.2.3.1 ADMISSIBILITY OF EXPERT EVIDENCE

In England, the admission of expert evidence in courts was endorsed in the year 1782 with the famous ruling by Lord Mansfield in the case of *Folkes v. Chadd*.⁴⁸⁹ The ruling was restated a few years later by Lord Ellenborough in the following terms: “*Where there was a matter of skill or science to be decided, the jury might be assisted by the opinion of those peculiarly acquainted with it from their professions or pursuits.*”⁴⁹⁰ This ruling captures the essence of the rules governing the admission of expert evidence in courts. Accordingly, the following are the conditions that shall be met for the admission of expert evidence in court:

a. The expert must be competent - *R v Silverlock*⁴⁹¹ is the landmark case that laid down that in order to testify as an expert in court the expert shall have required skills or expertise. The case continues to set the standard for what it takes to qualify as an expert. Lord Russell of Killowen CJ, in the *Silverlock* judgment, held that the expert must be peritus/skilled.⁴⁹² The skill or competency of an expert and how it is attained is the prime

⁴⁸⁶ JDSUPRA, Proposed Amended FRE 702 Confirms Court as Gatekeeper of Expert Testimony (18th April, 2022) <https://www.jdsupra.com/legalnews/proposed-amended-fre-702-confirms-court-2742255/> (last visited 31st Aug. 2022).

⁴⁸⁷ MINT, <https://www.livemint.com/Politics/SS2mCO9tbaCJLUMqxR3uRO/Indian-case-law-sets-precedent-for-Commonwealth-countries.html> (last visited on Jan. 23rd, 2022).

⁴⁸⁸ Law Commission, *Expert evidence in criminal proceedings in England and Wales*, Law Com No 325, 3 (21 March 2011) lawcommission.justice.gov.uk/areas/expert-evidence-in-criminaltrials.htm (last visited Oct. 30, 2012).

⁴⁸⁹ *Folkes v. Chadd*, (1782) 3 Doug KB 157.

⁴⁹⁰ *Beckwith v. Sydebotham*, 1 Camp. 116, 170 Eng. Rep. 897 (K. B. 1807).

⁴⁹¹ [1894] 2 QB 766.

⁴⁹² *Ibid.*

concern of the law.⁴⁹³ In 2010, in *R v Atkins*, it was reiterated that an expert witness must satisfy the threshold legal test of competency before being allowed to testify or submit an expert report in legal proceedings.⁴⁹⁴ Thus, competency is a primary qualification required to testify as an expert. The expert must be "skilled" via education or experience; the knowledge need not be obtained professionally.⁴⁹⁵ For instance, a police officer with special training on criminal gangs may give expert evidence concerning the features of criminal gangs, their culture, etc.⁴⁹⁶ Likewise, an engineer may give an expert opinion on the design and functioning of a machine.⁴⁹⁷

b. Subject matter of the expert opinion shall fall within the area of his expertise⁴⁹⁸
 – Expert evidence is admissible only to the extent it relates to his qualification/expertise. The expert's area of competence determines the types of opinion evidence he can give. An expert does not have the authority to testify on other subjects.⁴⁹⁹

c. Capacity to assist the court – It refers to the potential of the expert evidence to be able to provide assistance to the court in the judicial determination of the case. If the expert evidence is such that it provides the jury with the knowledge that they would ordinarily have, the evidence shall not be admitted.⁵⁰⁰ This is referred to as Common Knowledge rule. *R v Turner*⁵⁰¹ is the primary authority for the common knowledge norm in the common law. It means that the matters that are considered to be part of common knowledge need not be proved with the help of expert opinion. This concurs with the fact that expert evidence is admitted, despite being only opinions, because it provides the court with the knowledge that courts ordinarily do not have.⁵⁰² In cases where the

⁴⁹³ Rix, K.J., *Expert evidence and the courts: 1. The history of expert evidence*, 5(1) *Advances in Psychiatric Treatment* pp.71-77, 71 (1999).

⁴⁹⁴ *R v Atkins* [2010] 1 Cr App R 8, [2009] EWCA Crim 1876; *R v Stockwell* (1993) 97 Cr App R 260, CA; *R v Silverlock* [1894] 2 QB 766, CCR.

⁴⁹⁵ Turner, Barry, *Expert Opinion: United Kingdom, Canada, and Australia*, Wiley Encyclopaedia of Forensic Science 1 (2009).

⁴⁹⁶ *Myers, Brangman and Cox v The Queen*, [2015] UKPC 40; [2015] 3 WLR 1145, para 4.

⁴⁹⁷ *Kennedy v. Cordia*, 2016 UK SC 6, para 41.

⁴⁹⁸ Civil Evidence Act, 1972 (UK), s. 3.

⁴⁹⁹ Vinodh Kumarswamy S.C., REPORT OF THE LAW REFORM COMMITTEE ON OPINION EVIDENCE 7,44 (2011).

⁵⁰⁰ *R v. Strudwick and Merry*, (1994) 99 Cr App R 326.

⁵⁰¹ (1974) 60 Cr App Rep 80.

⁵⁰² Expert Witness Rules, <https://v1.lawgazette.com.sg/2001-8/Aug01-feature2.htm> (last visited on Jan. 23rd, 2022).

judge/jury can reach a conclusion regardless of expert opinion, expert evidence is not needed and, therefore, shall not be admitted.⁵⁰³

d. Relevant – Relevance is another requirement for the admission of any evidence, not just expert evidence. Expert evidence must be relevant to the issue before the court. Evidence shall have some probative worth concerning the matter that requires proof.⁵⁰⁴

3.2.3.2 GATEKEEPING FUNCTION QUA RELIABILITY

The gatekeeping function of the court is a well-established principle in England. The issue of the admissibility of expert evidence is to be decided by the court.⁵⁰⁵ This includes assessing whether the evidence would be helpful to the jury, whether the expert is competent, and whether the expert evidence is sufficiently reliable.⁵⁰⁶ There may be assistance available to the court in deciding the issues of admissibility, yet the ultimate decision is that of the court.⁵⁰⁷ It is important to note that evidence that are not challenged on any ground, including reliability, get admitted automatically.⁵⁰⁸ In England, a lax attitude to the admission of expert evidence has been recorded, and it is uncommon for any forensic evidence to be ruled inadmissible unless it is egregiously improper.⁵⁰⁹

As regards the assessment of the reliability of expert evidence, the courts have not established definite and fixed criteria. A flexible approach has been adopted. Different courts refer to different parameters while assessing the reliability of expert evidence, much like Indian courts.⁵¹⁰ In some cases, reliability has been held to be a non-essential condition for admission of evidence. For instance, in *R v. Robb*,⁵¹¹ the English Appellate Court took a liberal stance in accepting expert scientific evidence identifying the accused's voice from a taped discussion. In this instance, the expert admitted that this method was unreliable. However, the court admitted the opinion noting that neither widespread acceptability nor reliability is pre-condition for admission of expert

⁵⁰³ *R v Turner*, [1975] 1 QB 834, 841-2, CA.

⁵⁰⁴ *DPP v. Kilbourne*, [1973] AC 729, 756D

⁵⁰⁵ *R v Atkins and Atkins*, [2009] EWCA Crim 1876, para 9.

⁵⁰⁶ *R v. Stockwell*, (1993) 97 Cr App R 260, at 264.

⁵⁰⁷ *R. v. Reed, Reed and Garmson*, [2009] EWCA Crim 2698, para 111.

⁵⁰⁸ *R. v. Reed, Reed and Garmson*, [2009] EWCA Crim 2698, para 113.

⁵⁰⁹ The Law Commission. 2011 *Expert evidence in criminal proceedings in England and Wales*. London: Law Commission (accessed 20th April, 2015).

⁵¹⁰ *R v Luttrell* [2004] EWCA Crim 1344, para 37.

⁵¹¹ *R v. Robb*, [1991] Crim. L. R. 539.

evidence. According to the court, a scientific expert's testimony is acceptable if he is qualified by academic study and practical experience and is capable of providing testimony that is substantially more valuable than that of an untutored layperson.⁵¹² There is no enhanced test of admissibility.⁵¹³ In *R v. Luttrell and others*,⁵¹⁴ the court held that novel expert evidence, whether scientific or not, is admissible if it meets two conditions: first, that the witness's study or experience endows his or her opinion with authority that a person lacking that study or experience would lack; and second, that the witness was qualified to express the opinion. The court concluded that no particular assessment, such as verifiability or falsifiability, is required. The court held that “the policy of the English courts has been to be flexible in admitting expert evidence and to enjoy the advantages to be gained from new techniques and new advances in science.”⁵¹⁵

Ultimately, the trial judge has complete discretion in determining the threshold for admitting a specific piece of evidence. The English courts have primarily considered reliability as an issue to be determined by the jury at the time of weighing evidence.⁵¹⁶ The current *laissez-faire* approach of the courts concerning expert evidence is based on the presumption that the jury can efficiently distinguish between reliable and unreliable.

This approach of admitting expert evidence and the integrity of the English legal system has been questioned on account of erroneous convictions based on unreliable expert opinion.⁵¹⁷ The “Birmingham Six” is a well-known case where erroneous expert evidence caused six innocent people to linger in prison for 16 years.⁵¹⁸ In the aftermath of this wrongful conviction, the House of Commons Science and Technology committee declared that “the absence of an agreed protocol for the validation of scientific techniques prior to their being admitted in court is entirely unsatisfactory.”⁵¹⁹ Absence

⁵¹² *Ibid.*

⁵¹³ *R v. Dallagher* [2002] EWCA Crim 1903.

⁵¹⁴ [2004] All ER (D) 454.

⁵¹⁵ *Id.*, para 37.

⁵¹⁶ Gary Edmond, Simon Cole, Emma Cunliffe & Andrew Roberts, *Admissibility Compared: The Reception of Incriminating Expert Evidence (I.E., Forensic Science) in Four Adversarial Jurisdictions*, 3 U. Denv. Crim. L. Rev. 31, 57 (2013).

⁵¹⁷ *R v. Dallagher* [2002] EWCA Crim 1903; *R v. Clark* [2003] EWCA Crim 1020; *R v. Cannings* [2004] EWCA Crim 1; *R v. Harris and others* [2005] EWCA Crim 1980.

⁵¹⁸ *Regina v. McIlkenny & ors.*, (1991) 93 Cr App R 287; House of Commons Science and Technology Committee, FORENSIC SCIENCE ON TRIAL, (2005) <https://publications.parliament.uk/pa/cm200405/cmselect/cmsctech/96/96i.pdf> (last visited Jan. 24th, 2022).

⁵¹⁹ *Id.* para 173.

of an effective mechanism to filter unreliable evidence to avoid false convictions and the complacent attitude of the court is what worried the committee the most.⁵²⁰ The committee discussed the case of *R v. Clark*⁵²¹ to illustrate the lacunae in the assessment of expert evidence. In this case, a paediatrician's statistical evidence was admitted by the trial despite the fact that he did not have any qualification in statistics. Moreover, the probability evidence presented by this expert in court was inaccurate. A higher court in the second appeal pointed out that the probability estimate was "grossly overstated" and should not have been admitted in evidence.⁵²² Further, the committee took note of the developments in the U.S. and the *Daubert* judgment. It reiterated the demand for adoption of *Daubert*-like standards in U.K. by Dr Chris Pamplin,⁵²³ editor of the UK Register of Expert Witnesses, and The Association of Chief Police Officers (ACPO).⁵²⁴ It was specifically noted that a reliability test that is clear and objective would be highly beneficial in the evaluation of reliability and robustness of the theory or technique.

Prompted by the findings of the Science and Technology Committee, the Law Commission released a report titled "Expert evidence in criminal proceedings in England and Wales" (Law Com No 325).⁵²⁵ It must be made clear that the report has its focus on criminal cases, but the observations apply to expert testimony in civil matters also. The Law Commission concurred with the committee that courts were accepting expert testimony without proper scrutiny.⁵²⁶ It urged for more strict examination of expert evidence at the point of admission.⁵²⁷ The report concluded, among other things, that special rules are necessary for evaluating the reliability of expert testimony as a

⁵²⁰ *Id.* page 81.

⁵²¹ [2003] EWCA Crim 1020 (11 April 2003).

⁵²² *Id.* para 201.

⁵²³ Dr Chris Pamplin, *Taking experts out of the court*, *New Law Journal*, 26 November 2004.

⁵²⁴ House of Commons Science and Technology Committee, FORENSIC SCIENCE ON TRIAL, (2005) <https://publications.parliament.uk/pa/cm200405/cmselect/cmsctech/96/96i.pdf> (last visited Jan. 24th, 2022).

⁵²⁴ *Id.* page 76.

⁵²⁵ Law Commission, EXPERT EVIDENCE IN CRIMINAL PROCEEDINGS IN ENGLAND AND WALES, Law Com. No 325 (21 March 2011) lawcommission.justice.gov.uk/areas/expert-evidence-in-criminaltrials.htm (accessed on 30/10/2012).

⁵²⁶ House of Commons Science and Technology Committee, FORENSIC SCIENCE ON TRIAL, (2005) <https://publications.parliament.uk/pa/cm200405/cmselect/cmsctech/96/96i.pdf> (last visited on Jan. 24th, 2022).

⁵²⁷ Law Commission, EXPERT EVIDENCE IN CRIMINAL PROCEEDINGS IN ENGLAND AND WALES, Law Com. No 325 (21 March 2011) lawcommission.justice.gov.uk/areas/expert-evidence-in-criminaltrials.htm (accessed on 30/10/2012), at 7.

factor bearing on admissibility.⁵²⁸ One of the proposals presented by the Law Commission was – “We recommend that there should be a statutory admissibility test which would provide that an expert’s opinion evidence is admissible in criminal proceedings only if it is sufficiently reliable to be admitted (“the reliability test”).”

Although the government acknowledged the potential value of the recommendations made by the law commission, it refused to pass the required legislative amendments.⁵²⁹ The cost of implementing these provisions and the unquantifiable nature of the problem were the reasons cited by the government for not implementing the recommendation.⁵³⁰ The government, in its response, acceded that “this proposal if implemented, would enhance the existing common law rules, and potentially increase the likelihood that unreliable expert evidence would be excluded from criminal trials.”⁵³¹

To prevent wrongful convictions, the government called for changes in the Criminal Procedure Rules, which it hoped might improve the assessment of expert evidence by the trial judges.⁵³² As a result, certain amendments were made to the Criminal Procedure Rules and Criminal Practice Directions. Part 19 of the Criminal Procedure Rules (duties of an expert) and 19A of the Criminal Practice Directions were enacted.⁵³³ 19A.5 of the Criminal Practice Directions lists the following factors to be considered in determining the reliability of evidence:

- Quality of the data on which the report is based
- Validity of the methods used
- Accuracy of the inferences drawn by the expert with the help of statistical or other tools
- Peer reviews
- Completeness Facts/information forming the basis of the opinion and also if such information is part of the expert’s expertise
- Other possible opinion/conclusions⁵³⁴

⁵²⁸ Ministry of Justice, THE GOVERNMENTS RESPONSE TO THE LAW COMMISSIONS REPORT: EXPERT EVIDENCE IN CRIMINAL PROCEEDINGS IN ENGLAND AND WALES, (2013), p 5.

⁵²⁹ Criminal Practice Directions (2015) 19A.3.

⁵³⁰ Ministry of Justice, THE GOVERNMENTS RESPONSE TO THE LAW COMMISSIONS REPORT: EXPERT EVIDENCE IN CRIMINAL PROCEEDINGS IN ENGLAND AND WALES, (2013), p 5.

⁵³¹ *Ibid.*

⁵³² Stockdale, M., & Jackson, A., *Expert Evidence in Criminal Proceedings*, 80(5) J. of Crim. L., 344–363, 345 (2016).

⁵³³ ‘Lord Chief Justice of England and Wales’, <https://www.judiciary.uk/wp-content/uploads/2015/09/crim-pd-2015.pdf> (last visited on 28th March, 2024).

⁵³⁴ *Ibid.*

These Practice Directions are based on the recommendation of the Law Commission. These are helpful guidelines as Criminal Practice Directions are binding on courts.⁵³⁵ They serve the purpose of prompting a judge to take into consideration the same factors which the Law Commission recommended as a statutory test.⁵³⁶ With these changes, it is expected that expert opinion evidence would be rigorously challenged on the basis of inadequate reliability, and evidence that cannot be shown to satisfy the requisite standard can be excluded.⁵³⁷ In the case of *Kevin Breckani v Regina*,⁵³⁸ the court had to assess the evidence of a forensic social worker and a criminologist who was produced to prove that the accused was a victim of trafficking. The expert evidence was not admitted for having failed to demonstrate sufficient knowledge about modern slavery. The court in the case noted that the Criminal Practice Direction 19A.4 established that reliability is a factor for determining the admissibility of expert evidence and the courts shall be considered the factors set out in Practice Directions 19A.5 in order to assess the reliability.⁵³⁹

3.2.3.3 DUTIES OF AN EXPERT

Rule 35.3 of the Civil Procedure Rules 1998 (U.K.) mandates that experts assist the court on subjects within their expertise. Contractual obligations between the expert and the party calling the expert to court shall not affect the expert's duty towards court.⁵⁴⁰ In the case of *Field v. Leeds City Council*⁵⁴¹ the court refused to admit the report of an independent surveyor for having failed to demonstrate the impartiality and objectivity of his report. The most frequently cited judgment concerning expert duties in civil cases is *National Justice Compania Naviera SA v. Prudential Assurance Co Ltd (Ikarian Reefer, 1993)*.⁵⁴² The duties and responsibilities of experts, as mentioned in this case, are:

⁵³⁵ Criminal Practice Directions, 1A.3.

⁵³⁶ Ward, T., *A new and more rigorous approach" to expert evidence in England and Wales?*, 19(4) The International Journal of Evidence & Proof 228, 229 (2015).

⁵³⁷ Stockdale, M., & Jackson, A., *Expert Evidence in Criminal Proceedings*, 80(5) The J. of Crim. L. 344–363, 349 (2016).

⁵³⁸ [2021] EWCA Crim 731.

⁵³⁹ *Id.* para 49.

⁵⁴⁰ Civil Procedure Rules 1998 (UK), Rule 35.3(2).

⁵⁴¹ [2000] 1 EGLR 54.

⁵⁴² *National Justice CiaNavieraSA v Prudential Assurance Co Ltd. TheIkarian Reefer*, [1995] 1 Lloyd's 455.

1. Expert work should be independent of undue influences, such as necessities of litigation.
2. An expert shall act objectively and not advocate for the party calling him to court.
- 3 Expert shall present the foundational facts and assumptions without suppressing any critical information.
4. Expert shall state the limitations of the report freely, such as inadequacy of evidence, or lack of expertise.⁵⁴³

As regards the duties of the expert in criminal matters, rule 19 of the Criminal Procedure Rules 2020 (UK)⁵⁴⁴ states that:

1. Expert opinion must be objective and unbiased. (Rule 19.2.1)
2. He shall define his area of expertise, and his opinion shall lie within his area of expertise. (Rule 19.2.1).
3. This duty shall override the expert's duties towards the person hiring him. (Rule 19.2.2)
4. It shall be a duty of an expert to provide information relating to his qualification, experience, accreditation, literature, and facts that he relied on, limitations of the findings, a summary of the conclusions, and other information that may help the court in reliability assessment of the expert report. (Rule 19.4)
5. Expert is also duty bound to state that he acknowledges and understands his duty towards the courts. Also, he shall file a declaration concerning truthfulness of his report.

These rules make it clear that every expert witness should strive to provide credible scientific evidence.⁵⁴⁵ This is a mandatory requirement law.⁵⁴⁶ Expert witnesses should be prepared to explain the basis of their findings.⁵⁴⁷ An expert report devoid of the reasoning underlying the conclusions shall be considered unworthy as it cannot be appraised or cross-examined.⁵⁴⁸ These duties of an expert are not inconsequential. An

⁵⁴³ *Id.* part V-B.

• ⁵⁴⁴ 2020 No. 759 (L. 19).

⁵⁴⁵ *Pora v The Queen*, [2015] UKPC 9, para 24.

⁵⁴⁶ Jackson, G., Aitken, C. and Roberts, P., *Case assessment and interpretation of expert evidence. Guidance for judges, lawyers, forensic scientists and expert witnesses*, (4) Practitioner guide 17 (2015).

⁵⁴⁷ Jackson, G., Aitken, C. and Roberts, P., *Case assessment and interpretation of expert evidence. Guidance for judges, lawyers, forensic scientists and expert witnesses*, (4) Practitioner guide 21 (2015).

⁵⁴⁸ *Davie v Magistrates of Edinburgh*, (1953) SC 34.

expert in dereliction of his duties towards court jeopardizes his reputation and, in an appropriate case, the court may impose a cost against him.⁵⁴⁹

Further, it is desirable that the expert testifying in court shall have no real or apparent interest in the outcome of the litigation.⁵⁵⁰ Evidence of an interested expert may or may not be admitted depending on the nature of his interest in the litigations.⁵⁵¹ For instance, expert evidence, in the case of *EXP v. Baker*,⁵⁵² was refused on the ground that the expert failed to disclose that the party for whom he was testifying in courts was a close associate and had been a co-author with the expert in the publication of research. There is no automatic ban on the admissibility of evidence by an expert who has interest in the litigation.⁵⁵³ There may be a case where the nature of the expert's interest is such that it does not warrant exclusion.⁵⁵⁴ Though, the fact that the expert has an interested person may have an effect on the weight of the evidence.⁵⁵⁵

3.2.3.4 COURT-APPOINTED EXPERT

The authority of Courts to summon witnesses has been established for a long period in England. However, it is recognized that this power should be used cautiously and seldom.⁵⁵⁶ Court-appointed witness may be asked to testify without the consent of the prosecution or defence in the interest of the administration of justice.⁵⁵⁷ However, such a witness should not be summoned after the defence argument has been concluded unless an issue arises "ex improviso" that no human intellect could anticipate.⁵⁵⁸ While courts have the theoretical capacity to summon experts, in reality, the adversarial environment militates against the use of this authority.⁵⁵⁹

⁵⁴⁹ *Robinson v Mercier*, [2021] 9 WLUK 400.

⁵⁵⁰ *Armchair Passenger Transport Ltd. v. Helical Bar Plc*, [2003] EWHC 367 (Q.B.).

⁵⁵¹ *Ibid.*

⁵⁵² [2017] EWCA Civ 63.

⁵⁵³ *Ibid.*

⁵⁵⁴ *Ibid.*

⁵⁵⁵ *Ibid.*

⁵⁵⁶ *R v Grajton*, [1993] QB 101 107 (CA).

⁵⁵⁷ *R v Liddle*, 1928 21 Cr App R 3; *R v McMahon* 1953 Cr App R 95; *R v. Holdn* (1830) VillC & P 606 610.

⁵⁵⁸ *N v Frost*, 1983 4 St Tr 385 386; *R v Harris*, [1927] 2 KB 587; *R v Cekghorn*, [1967] 2 QB 584.

⁵⁵⁹ Lirienka Meintjes-Van der Walt, *The Presentation of Expert Evidence at Trials in South Africa, The Netherlands and England and Wales*, 12 Stellenbosch L. Rev. 283 (2001).

3.2.3.5 TAKE AWAY POINTS

The most important observation from the above analysis is the recommendations made by the Law Commission.⁵⁶⁰ The Law Commission emphatically pointed out the need for specific rules for assessing the reliability of expert evidence. Surprisingly, the government conceded that the adoption of a statutory reliability test would mitigate the chances of error in decision-making but refused to give effect to the recommendations. The grounds on which the recommendations were not implemented are not very convincing. In light of the imminent threat to the integrity of the judicial system as a result of erroneous judicial decisions, such recommendations ought to have been implemented. Adoption of 19A of the Criminal Practice Directions and Rule 19 of the Criminal Procedure Rules are certain welcome steps. It is noteworthy that the factors mentioned in Rule 19A of the Criminal Practice Direction are similar to the *Daubert* factors. Infact *Daubert* factors are not fixed or rigid. They are merely illustrative. And, thus, it can be said that the emphasis in *Daubert* judgment, Rule 702 of the Federal Rules of Evidence and Rule 19A of the Criminal Practice Directions (U.K.) is on providing an explicit reliability test. What factors or parameters constitute the part of the reliability test is not material or pre-determined. Therefore, it can be concluded that there is a similarity in the approach in the U.S. and U.K. towards the assessment of the reliability of expert evidence, and is worthy of being adopted by other nations that lack an express reliability test such as India.

Further, the duties of an expert are expressed in the statutory form. And these duties are not meaningless. Dereliction of these duties leads to adverse consequences and specific mention of duties is an effective means to ensure objectivity and impartiality of expert evidence. Also, assessment of expert evidence in light of duties of the expert is part of gatekeeping function. These are worthy measures that ought to be borrowed by Indian policymakers.

3.2.4 AUSTRALIA

India shares many similarities with Australia, such as common legal tradition, constitutional texts, etc.⁵⁶¹ Also, there is a practice of seeking guidance from decisions

⁵⁶⁰ Law Commission, EXPERT EVIDENCE IN CRIMINAL PROCEEDINGS IN ENGLAND AND WALES, Law Com. No 325 (21 March 2011) lawcommission.justice.gov.uk/areas/expert-evidence-in-criminaltrials.htm (last visited 30/10/2012).

⁵⁶¹ CONSTITUTIONAL PERSPECTIVES: ESSAYS IN HONOUR OF H M SEERVAI CONSTITUTIONAL LAW: INDIAN AND AUSTRALIAN ANALOGUES,

of Federal Supreme Courts and High Court of Australia by Indian Judges.⁵⁶² Likewise there have been occasion wherein the Australian courts have drawn help from Indian decisions.⁵⁶³ It is, therefore, useful to make the laws and legal practices prevalent in Australia part of this study.

3.2.4.1 ADMISSIBILITY OF EXPERT EVIDENCE

In Australia, the Uniform Evidence Act⁵⁶⁴ is majorly the same as legislation adopted by the Commonwealth and by other States and Territories.⁵⁶⁵ As per this Act, the following are the conditions for the admission of expert evidence:

1. Relevance – As is the case with most common law jurisdictions, the first requirement of admissibility is relevancy. All relevant evidence are admissible in court.⁵⁶⁶ Evidence that has the capacity of assisting in determining the existence of a fact in issue is relevant.⁵⁶⁷ However, Section 76 of the Act lays down the opinion rule. The section makes inadmissible the evidence of an opinion. Nevertheless, the Act provides several exceptions, including the opinion of an expert. Section 79(1) provides that an expert may give his opinion as evidence in court if the opinion is based on the expert's specialised knowledge.
2. Necessity – The subject matter of the expert evidence shall be such that it is not reasonably feasible for a non-expert to assess the evidence.⁵⁶⁸
3. Specialised Knowledge - The requirement that an expert possessing specialised knowledge for the admission of expert evidence flows from section 79 of the Evidence Act. There are two wings of section 79. First is 'specialised knowledge shall be based on the person's training, study or experience'.⁵⁶⁹ Secondly, the opinion must be 'wholly or substantially based on that knowledge'.⁵⁷⁰ 'Specialised knowledge' refers to

https://www.hcourt.gov.au/assets/publications/speeches/former-justices/kirbyj/kirbyj_seervai.htm (last visited 3rd Sept, 2022).

⁵⁶² *Ibid.*

⁵⁶³ *Bropho v Western Australia*, (1990) 171 CLR 1.

⁵⁶⁴ Evidence Act 1995.

⁵⁶⁵ Evidence Act 1995 (Cth); Evidence Act 1995 (NSW); Evidence Act 2001 (Tas); Evidence Act 2008 (Vic); and Evidence Act 2011 (ACT); *IMM v The Queen* [2016] HCA 14, para 9.

⁵⁶⁶ Evidence Act, 1995, s. 55.

⁵⁶⁷ Evidence Act, 1995, s. 56 (1).

⁵⁶⁸ *The Queen v. Bonython*, (1984) 38 SASR 45.

⁵⁶⁹ Buckland, Prudence, *Honeysett v The Queen* (2014) 311 ALR 320: *Opinion evidence and reliability, a sticking point*, 35(2) Adelaide Law Review 449-461, 450 (2014).

⁵⁷⁰ *Ibid.*

knowledge that is beyond the comprehension of people who have not studied or experienced that field of knowledge.⁵⁷¹ Thus for an expert opinion to be admissible in court, the expert shall have specialised knowledge and the expert opinion shall be based on his specialised knowledge. The opinion may relate to a matter that is not scientific or technical in nature. Further, a person without formal qualifications may acquire specialised knowledge through experience. But in the absence of proof of specialised knowledge, the expert evidence shall be considered merely speculative.⁵⁷² Opinions that are based on subjective belief and speculation are not admissible.⁵⁷³ For instance, in the case of *Honeysett v The Queen*,⁵⁷⁴ an expert of anatomy sought to give evidence of forensic identification of people involved in an armed robbery on the basis of analysis of the CCTV footage of the incident. He identified several common features among the accused and the person in the CCTV footage.⁵⁷⁵ It was contended on behalf of the expert witness that he had acquired specialised knowledge by way of repeatedly examining CCTV images.⁵⁷⁶ The High Court of Australia held that the expert evidence was not founded on the study of structure but was based on his personal perception and was therefore inadmissible.

3.2.4.2 GATEKEEPING FUNCTION

The gatekeeping function of a judge is well-recognised in Australia. Courts are not bound to accept an expert opinion.⁵⁷⁷ The New South Wales Court of Appeal, in the case of *Makita(Australia) Pty Ltd v. Sprowles*,⁵⁷⁸ have held that "court is not obliged to take the opinion of an expert as conclusive even though no other expert is called to contradict it".⁵⁷⁹ Further, the court has full authority to question the veracity of an expert report even if no evidence has been produced to contradict the expert report.⁵⁸⁰ As a part of the gatekeeping function, the court may examine whether the expert has usurped the function of a trial judge, or whether the expert has not provided the necessary information that forms the basis of his report, or if there was an independent and

⁵⁷¹ *Honeysett v, Queen*, (2014) 311 ALR 320, 325 [23].

⁵⁷² Gary Edmond and Mehera San Roque, *Before the High Court: Honeysett v The Queen: Forensic Science, 'Specialised Knowledge' and the Uniform Evidence Law*, 36 Sydney L. Rev. 323, 335 (2014).

⁵⁷³ *Honeysett v. Queen*, (2014) 311 ALR 320, 325 [23].

⁵⁷⁴ *Ibid.*

⁵⁷⁵ *Id.* at 35.

⁵⁷⁶ *Id.* at 39.

⁵⁷⁷ *Makita (Australia) Pty Ltd v. Sprowles*, [2001] ACL Rep 300 NSW 74, para 87.

⁵⁷⁸ *Ibid.*

⁵⁷⁹ *Ibid.*

⁵⁸⁰ *Ibid.*

objective application of the technique to the facts of the case, or if the report is fundamentally sound.⁵⁸¹ For instance, in the case of *Metropolitan Petar v. Mitreski*,⁵⁸² the court rejected the expert evidence of a builder pertaining to the cost of building work for want of the basis of his estimation.

The approach of judges in Australia with respect to gatekeeping function is different from that of the courts in England and U.S. In Australia, the emphasis is mainly on the attainment of expertise and application of specialised knowledge. Reliability is not seen as a condition precedent for the admission of expert evidence. The reasoning behind expert opinion is not questioned in Australian courts.⁵⁸³ When expert opinion evidence is challenged, courts are primarily concerned with the proof that the evidence is based on '*specialized knowledge*' and that the specialised knowledge is the result of '*training, study, or experience*'.⁵⁸⁴ The expert opinion shall be presented in a manner which allows a judge to decide these questions.⁵⁸⁵ Australian courts have been unwilling to read the requirement that opinions be reliable into the requirement for 'wholly or substantially based' on 'specialized knowledge' under s 79(1) of the Evidence Act, 1995. Spigelman CJ argued in *R v Tang*⁵⁸⁶ for the New South Wales Court of Criminal Appeal that 'the emphasis of attention must be on the words "*specialised knowledge*," not on the insertion of an extraneous concept such as "reliability." The interpretation that section 79(1) 'is not concerned with the expert's credibility' was recently reaffirmed in *Chen v The Queen* ('*Chen*').⁵⁸⁷ The Victorian Court of Appeal affirmed the absence of reliability as a condition for admissibility in *R v Tuite*⁵⁸⁸. In the case of *R v Tuite*, the Supreme Court of Victoria rejected the issue of reliability of DNA evidence as a ground of appeal. It held that "the question of the reliability of an expert opinion does not fall to be considered under s 79(1)."⁵⁸⁹

⁵⁸¹ *Ibid.*

⁵⁸² (2010) NSWSC 1185, para 9.

⁵⁸³ Gary Edmond, *Icarus and the Evidence Act: Section 137, Probative Value and Taking Forensic Science Evidence at Its Highest*, 41 MELB. U. L. REV. 106 (2017).

⁵⁸⁴ *Honeysett v The Queen*, (2014) 88 ALJR 786.

⁵⁸⁵ *HG v The Queen*, (1999) 197 CLR 414 at 427 [39].

⁵⁸⁶ (2006) 65 NSWLR 681, 712 (138).

⁵⁸⁷ [2018] NSWCCA 106, para 62.

⁵⁸⁸ [2015] VSCA 148, para 70.

⁵⁸⁹ *Id.* para 10.

Scholars have criticised this approach, noting that emphasis is placed on reliability in other common law nations.⁵⁹⁰ Gary Edmond holds that it is unfortunate that the assessment of expert evidence does not require the expert to prove or provide information regarding the validity of the technique involved, its rate of error, etc.⁵⁹¹ When Australian courts examine the admission of expert testimony, they focus on the subject area of the expert opinion. Additionally, there is an expectation that the evidence shall be of assistance to the jury in the rightful determination of the case. Generally, the reliability of expert opinion evidence is seen as a weight-of-evidence issue for the trier of fact.⁵⁹² This approach is indicative of the court's excessive reliance on expert's knowledge.⁵⁹³ The Evidence law has been interpreted in a way that the issue of reliability of forensic evidence is matters for a jury. but a jury would need to be cautioned by the trial judge about potentially unreliable evidence according to Section 165 of the Act. This section, to some extent, addresses the concerns relating to evidence that may be unreliable.⁵⁹⁴ Section 165(2) states that a judge may give to the jury a warning that admitted evidence may be unreliable and that there may be a need to be cautious while assigning weight to it.

Further, the courts have the discretion to exclude evidence that is unjustly prejudicial, confusing, misleading, or causes unjustified delay.⁵⁹⁵ This is a discretionary provision. But, in criminal proceedings, as per section 137, it is mandatory that evidence that is unfairly prejudicial shall not be admitted.⁵⁹⁶ The purpose behind these powers to exclude evidence is to filter out evidence that may lead to inaccurate judicial decision.⁵⁹⁷ This is like a statutory safety valve.⁵⁹⁸ In the case of *R v Tuite*, the Supreme Court of Victoria specifically elaborated on how reliability shall be assessed for the purpose of section

⁵⁹⁰ Buckland, Prudence, *Honeysett v The Queen* (2014) 311 ALR 320: *Opinion evidence and reliability, a sticking point*, 35(2) Adelaide Law Review 449-461, 455 (2014).

⁵⁹¹ Gary Edmond, *Icarus and the Evidence Act: Section 137, Probative Value and Taking Forensic Science Evidence at Its Highest*, 41 MELB. U. L. REV. 106,108 (2017).

⁵⁹² Gary Edmond, *The Science of Miscarriages of Justice*, 37 U.N.S.W.L.J. 376 (2014).

⁵⁹³ Gary Edmond and Mehera San Roque, *Before the High Court: Honeysett v The Queen: Forensic Science, 'Specialised Knowledge' and the Uniform Evidence Law* 36 Sydney L. Rev. 323, 332 (2014).

⁵⁹⁴ *IMM v. Queen*, [2016] HCA 14, para 18.

⁵⁹⁵ Evidence Act, 1995, s. 135.

⁵⁹⁶ Evidence Act, 1995, s. 137.

⁵⁹⁷ Gary Edmond; David Hamer; Andrew Ligertwood; Mehera San Roque, Christie, *Section 137 and Forensic Science Evidence (After Dupas v. the Queen and R v. XY)*, 40 MONASH U. L.REV. 389-412, 392 (2014).

⁵⁹⁸ *Ibid.*

137.⁵⁹⁹ It held that reliability is another term for trustworthiness, which in turn is based on validation.⁶⁰⁰ Interestingly, the court referred to *Daubert*, the U.K. Law Commission's report on Expert Evidence in Criminal Proceedings (March 2011) and the Practice Directions with approval.⁶⁰¹ It held that statutory reliability standards/tests shall be brought in force in Australia as well to help the trial judge assess evidentiary reliability.⁶⁰² However, the High Court of Australia in the case of *IMM v. The Queen* gave a different interpretation to section 137 and held that it is not required for the court to evaluate the reliability of evidence for the purpose of section 137.⁶⁰³ Thus since the judgment of *IMM v. The Queen*, none of the Australian jurisdictions require experts to provide information about the reliability of the expert evidence.⁶⁰⁴ The status of *Tuite* and its ratio is uncertain in light of the judgment of the High Court of Australia in *IMM v. Queen*.⁶⁰⁵

3.2.4.3 DUTIES OF EXPERT

The primary duty of an expert witness is to provide objective assistance to the court.⁶⁰⁶ This responsibility takes precedence over the expert witness's obligation to the engaged party.⁶⁰⁷ An expert witness is not a party's advocate.⁶⁰⁸ It is expected that the expert opinion shall be independent and impartial.⁶⁰⁹ Rule 4.1 of the Expert Evidence Practice Note⁶¹⁰ provides that:

The role of the expert witness is to provide relevant and impartial evidence in his or her area of expertise. An expert should never mislead the Court or become an advocate for the cause of the party that has retained the expert.

⁵⁹⁹ *R v Tuite*, [2015] VSCA 148, para 85.

⁶⁰⁰ *Id*, para 101.

⁶⁰¹ *Id*, para 110,113.

⁶⁰² *Id*, para 114.

⁶⁰³ *Ibid*.

⁶⁰⁴ Gary Edmond, *Icarus and the Evidence Act: Section 137, Probative Value and Taking Forensic Science Evidence at Its Highest*, 41 MELB. U. L. REV. 106,152 (2017).

⁶⁰⁵ Martire, Kristy A., and Gary Edmond, *Rethinking expert opinion evidence*, 40(3) Melbourne University Law Review 967,998 (2017).

⁶⁰⁶ Rule 4.1 of the Expert Evidence Practice Note; John Middleton, "*Guidelines for Expert Witnesses in Federal Court Proceedings in Australia*, (1998), <https://www.fedcourt.gov.au/digital-law-library/judges-speeches/justice-middleton/Middleton-J-200710.rtf> (last visited Sept. 9th, 2021).

⁶⁰⁷ *Ibid*.

⁶⁰⁸ *Ibid*.

⁶⁰⁹ *Cross on Evidence* (Aust. loose-leaf ed.) [29080] (Service 68).

⁶¹⁰ FEDERAL COURT OF AUSTRALIA, <https://www.fedcourt.gov.au/law-and-practice/practice-documents/practice-notes/gpn-expt> (last visited on 5th Sept. 2022).

An 'interested' person, such as an employee of the retaining party, can qualify as an expert and may testify for the employer.⁶¹¹ The objectivity and impartiality of an expert are matters to be considered at the time of weighing the evidence generally.⁶¹² These considerations do not hinder the admissibility of the evidence. However, breach of these duties could lead imposition of exemplary costs on the expert.⁶¹³

Further, it is the duty of an expert to provide to the court information concerning the manner in which the expert has acquired specialised knowledge, facts and assumptions underlying the expert opinion, the reasoning on which the opinion is based, and an acknowledgement that the opinion is based on expertise.⁶¹⁴ The information so provided in the report shall help the court in efficiently screening the evidence.⁶¹⁵ The High Court of Australia has ruled in the case of *Dasreef Pty Ltd. v. Hawchar*⁶¹⁶ that the usefulness of expert views is determined by what the trier of fact can do with them. If the assumed facts are not stated, no reasoning process can be discerned, and the opinion will be without utility.⁶¹⁷ Admissibility is not contingent on the reasoning being recognised as accurate but on the presentation of the reasoning. The correctness of the reasoning is decided at the conclusion of the trial. This decision recognises a recognised principle that the facts upon which the expert opinion is based must be established. This is referred to as "the basis rule": a rule that prohibits the use of opinion evidence unless the factual foundations for the view are demonstrated by other evidence. This rule is based on the premise that

the trier of fact must arrive at an independent assessment of the opinions and their value, and this cannot be done unless their basis is explained⁶¹⁸ and the jury cannot weigh and determine the probabilities for themselves if the expert does not fully expose the reasoning relied on.⁶¹⁹

⁶¹¹ *FGT Custodians Pty. Ltd. v. Fagenblat*, [2003] VSCA 33, at para 25.

⁶¹² I. FRECKELTON AND H. SELBY, *EXPERT EVIDENCE: LAW, PRACTICE, PROCEDURE AND ADVOCACY*, 35 (5th ed. 2013).

⁶¹³ *Hudspeth v Scholastic Cleaning and Consultancy Services Pty Ltd & ors (No 8)*, [2014] VSC 567.

⁶¹⁴ Rule 23.02 and Rule 23.13 of the Federal Court Rules, 2011.

⁶¹⁵ Gary Edmond, *Specialised Knowledge, the Exclusionary Discretions and Reliability: Reassessing incriminating expert opinion evidence*, 31(1) *Uni. of New South Wales Law J.* 1, 43 (2008).

⁶¹⁶ (2011) 277 ALR 611.

⁶¹⁷ *Id.* para 129.

⁶¹⁸ *Makita (Australia) Pty Ltd v. Sprowles*, [2001] ACL Rep 300 NSW 74, para 68.

⁶¹⁹ *Id.* para 67.

The significance of establishing the facts supporting an opinion is that their absence deprives the court of an essential opportunity to test the validity of the process by which the opinion was formed and substantially reduces the value and cogency of the opinion evidence.⁶²⁰ This clearly establishes a direct nexus between the duties of an expert and the gatekeeping function of a judge.

The ‘basis rule’ is applied seriously when evidence is presented before a jury, and the rule is relaxed when the trial is conducted by a judge.⁶²¹ It is believed that a judge can disregard expert evidence as non-probative if the foundational facts are not established.⁶²²

3.2.4.4 COURT APPOINTED EXPERT

The Federal Court Rules, 2011⁶²³ explicitly empower a judge to appoint an expert itself or on application by a party. Rule 23.01 provides that a party may make an application to the court for the appointment of Court expert. Under Rule 1.40, the court may appoint an expert on its own motion.

3.2.4.5 TAKE AWAY POINTS

In Australian legal system, the emphasis is on the eradication of partisan bias.⁶²⁴ The country has specific laws in relation to duties of the expert and the appointment of an expert by the court. Also, there are explicit provisions that give discretion to the judge to exclude evidence that is unjustly prejudicial, confusing, misleading, or causes unjustified delay.⁶²⁵ There is a mandatory rule that, in criminal proceedings, unfairly prejudicial evidence shall not be admitted.⁶²⁶ These are important legislations that can be borrowed by the Indian legal system. Making the discretionary power of a judge explicit plays a significant role in ensuring that judge is well aware of this discretionary power and they use this power in appropriate cases.

⁶²⁰ *Id.* para 77.

⁶²¹ *R v Fowler*, (1985) 39 SASR 440 at 442.

⁶²² *Ibid.*

⁶²³ Select Legislative Instrument No. 134, 2011, under Federal Court of Australia Act, 1976.

⁶²⁴ Gary Edmond, Simon Cole, Emma Cunliffe & Andrew Roberts, *Admissibility Compared: The Reception of Incriminating Expert Evidence (I.E., Forensic Science) in Four Adversarial Jurisdictions*, 3 U. Denv. Crim. L. Rev. 31, 82 (2013).

⁶²⁵ Evidence Act, 1995, s. 135.

⁶²⁶ Evidence Act, 1995, s. 137.

There is much to be learned indirectly from the Australian legal jurisprudence. The non-consideration of ‘reliability’ as a requirement for the admissibility of expert evidence has been severely criticised. *Buckland* holds that “a test of reliability will ensure the standards governing admissibility of expert evidence in Australia are au courant and sufficiently scrupulous.”⁶²⁷ It has also been contended that the rightful assessment of evidence for the purpose of admission can be made if the court pays attention to information that indicates the reliability and validity of the expert evidence.⁶²⁸ In the context of India, though reliability is a consideration for the admission of evidence, it remains to be seen how the assessment of reliability is carried out. If the assessment of expert evidence is based on factors that are not indicative of reliability, then it is not an effectual evaluation.⁶²⁹ And in that case, India is no better than the Australian legal system. Resultantly, the demand for an overhaul of the evaluation process would apply as much to India as to Australia.

3.2.5 CANADA

In Canada, despite the adoption of laws at both the federal and provincial levels, there is no comprehensive codification of evidence law. It is common law that fills the gap left by statutes.⁶³⁰ A large portion of criminal law's evidentiary standards are based on English and Canadian precedents and are not codified.⁶³¹

3.2.5.1 ADMISSIBILITY OF EXPERT EVIDENCE

R. v. Mohan,⁶³² a Canadian Supreme Court judgment, is an oft-quoted authority on the issue of the admissibility of expert evidence.⁶³³ The Supreme Court, in this judgment, laid down the following fourfold criterion for the admission of expert evidence:

a. The expert evidence must be relevant – Similar to the other common law jurisdictions, the most fundamental rule of evidence is that all expert evidence shall be relevant.⁶³⁴

⁶²⁷ Buckland, Prudence, *Honeysett v The Queen* (2014) 311 ALR 320: *Opinion evidence and reliability, a sticking point*, 35(2) *Adelaide Law Review* 449-461, 461 (2014).

⁶²⁸ Martire, Kristy A., and Gary Edmond, *Rethinking expert opinion evidence*, 40(3) *Melbourne University Law Review* 967,997 (2017).

⁶²⁹ *Ibid.*

⁶³⁰ David Paciocco & Lee Stuesser, *THE LAW OF EVIDENCE*, 7 (2nd ed., Toronto: Irwin Law, 1999).

⁶³¹ James Bowron, Leo Ducharme, *Law of Evidence*, *THE CANADIAN ENCYCLOPEDIA* (Feb. 2012), <https://www.thecanadianencyclopedia.ca/en/article/law-of-evidence> (last visited 29th Aug. 2022).

⁶³² (1994) 2 SCR 9.

⁶³³ INPUT ACR, <https://input-ace.com/kelly-frye-daubert-mohan-and-why-you-need-to-understand-these-cases/> (last visited Aug. 16th, 2021).

⁶³⁴ HAMISH STEWART, ET AL, *EVIDENCE: A CANADIAN CASEBOOK*, 3 (3rd ed., Toronto: Emond Montgomery, 2012).

Relevance was defined as "logical relevance" in *White Burgess Langille Inman v. Abbott and Haliburton*⁶³⁵ by the Supreme Court. Logically relevant evidence are those that "have a tendency as a matter of human experience and logic to make the existence or non-existence of a fact in issue more or less likely than it would be without the evidence."⁶³⁶ Expert evidence must meet the same standard of relevance as all other evidence are required to meet in order to be admissible.⁶³⁷ As a matter of law, relevance must be assessed by a court.⁶³⁸

b. Necessity – Neither a low nor an overly demanding standard shall be used to determine whether expert testimony is required for the determination of the case.⁶³⁹ *R. v. Abbey*,⁶⁴⁰ Dickson J., held that in cases where the judge/jury can reach a conclusion in the absence of expert evidence, the expert evidence shall be considered as unnecessary. When the judge or jury would be unable to accurately reach a judgment on the issue at hand without the expert's aid, expert testimony is required to be introduced into evidence in court.⁶⁴¹ This rule is similar to the rule that excludes evidence on matters considered to be part of common knowledge. In other words, to be considered necessary, the expert's judgment must fall outside of the judge's sphere of knowledge.⁶⁴² In *Kelliher (Village of) v. Smith*⁶⁴³ the court stated that for expert evidence to be admissible, "the subject-matter of the inquiry must be such that ordinary people are unlikely to form a correct judgment about it if unassisted by persons with special knowledge."

c. The evidence must not be excluded by other rules of evidence – Expert evidence may be barred by exclusionary rules, such as if it is more prejudicial than probative, if it causes unreasonable delay, or if it is confusing/misleading, etc.⁶⁴⁴ A court's estimation of the evidence's worth and importance is known as probative value. Evidence is considered as prejudicial if it could potentially excite the jury's emotions, generate an

⁶³⁵ *White Burgess Langille Inman v. Abbott and Haliburton*, 2015 SCC 23, para 23.

⁶³⁶ *R v. Abbey*, 2009 ONCA 624, para 82.

⁶³⁷ *R v. Mohan*, (1994) 2 SCR 9.

⁶³⁸ *Ibid.*

⁶³⁹ *R v. Mohan*, (1994) 2 SCR 9.

⁶⁴⁰ [1982] 2 S.C.R. 24, p 42.

⁶⁴¹ *Regina v. Abbey*, [1982] 2 S.C.R. 24.

⁶⁴² Nancy Shapiro and David Silver, *Evidence 101 –A Primer on Evidence Law*, https://kmlaw.ca/wp-content/uploads/2015/09/NSDS_EVIDENCE101_A_PRIMERONEVIDENCELAW_03jun141.pdf (last visited on Jan. 25th, 2022).

⁶⁴³ [1931] S.C.R. 672, p. 684.

⁶⁴⁴ *R v. Mohan*, (1994) 2 SCR 9.

unfair astonishment, or unduly affect their judgment.⁶⁴⁵ A commendable illustration in this context is the case of *R. v. Bourguignon*.⁶⁴⁶ In this case, Flanigan J. accepted much of the expert evidence but omitted statistical information indicating the likelihood of a DNA match in his voir dire decision on the admissibility of DNA evidence. The learned judge explained that if such statistical information is made part of the evidence, there is a possibility that the jury may give undue deference to this evidence because of its complex and confusing nature. Probative value and prejudicial impact these two factors are weighed against each other to determine whether or not the evidence shall be excluded.

d. The expert testimony must be provided by a suitably qualified expert. – Finally, the evidence must be a person who has gained special knowledge through study or experience.⁶⁴⁷

e. Reliability - There have been different views in relation to reliability as a condition for admissibility to evidence. Reliability has not been expressly mentioned in *R v. Mohan*. Yet, the Supreme Court in the case held that courts should take reliability into account when deciding issues involving disputed or novel scientific theories.⁶⁴⁸ However, reliability as a condition for admissibility in the case of novel scientific techniques was categorically recognised in *White Burgess Langille Inman v. Abbott and Haliburton Co.*⁶⁴⁹ The importance of 'reliability' was reaffirmed in *R v Trochym*,⁶⁵⁰ the court said that reliability as a factor for admissibility of evidence is not limited to novel techniques. Also, the reliability of evidence shall not be assessed at the stage of assessing the weight of evidence but shall be taken into consideration at the stage of admission.⁶⁵¹ The Supreme Court noted that undue reliance on expert testimony and non-assessment of reliability of evidence by the court has resulted in wrongful convictions in the past.⁶⁵²

The issue of unjust convictions and deceptive expert evidence is taken very seriously. Notably, in the case of misleading expert testimony by Dr. Charles Smith, the erring

⁶⁴⁵ *R v Seaboyer*, [1991] 2 SCR 577; *R v Clarke*, (1998), 129 CCC (3d) 1, 18 CR (5th) 219 at 34 [Clarke].

⁶⁴⁶ [1991] O.J. No. 2670 (Q.L.)

⁶⁴⁷ *R v. Mohan*, (1994) 2 SCR 9.

⁶⁴⁸ *R v. Mohan*, (1994) 2 SCR 9.

⁶⁴⁹ 2015 SCC 23.

⁶⁵⁰ [2007] 1 SCR 239, 260.

⁶⁵¹ *Ibid.*

⁶⁵² *Ibid.*

expert was subjected to severe punishment. Dr. Charles Smith was a Canadian pathologist and head of the Hospital for Sick Children's Ontario Pediatric Forensic Pathology Unit in Toronto. Between 1982 and 2003, he performed hundreds of autopsies and testified in many criminal cases. In 2008, a public investigation uncovered significant flaws in Dr. Smith's work. Numerous criminal convictions obtained as a consequence of his evidence have subsequently been reversed.⁶⁵³

3.2.5.2 GATEKEEPING FUNCTION

Gatekeeping function of a judge is a fundamental rule of expert evidence in Canada also.⁶⁵⁴ Canadian jurisprudence attaches special significance to the judge's gatekeeping role.⁶⁵⁵ The standards of admission of evidence have "progressively tightened" during the last two decades.⁶⁵⁶ This evolution is meant to ensure that expert opinions do not go into evidence without being adequately scrutinised.⁶⁵⁷ The Supreme Court has stressed that the trial judge's function as "gatekeeper" should be taken seriously.⁶⁵⁸ In *R v Trochym*,⁶⁵⁹ the court showcased its seriousness toward gatekeeping function and held that "even if it has received judicial recognition in the past, a technique or science whose underlying assumptions are challenged should not be admitted in evidence without first confirming the validity of those assumptions."⁶⁶⁰

Time and again, the courts have underlined the critical role that the trial judges performed as "gatekeepers" in excluding expert evidence that would have caused bias, confusion, wasted time and money if admitted.⁶⁶¹ According to recent judgments, Canada's legal system seems to be substantially influenced by the laws and legal practices in the U.S.⁶⁶² Canadian courts have adopted *Daubert* standards by way of

⁶⁵³ *R. V. Blackett*, 2018 PNCA 119; *R v. Brant*, 2011 ONCA 362; Erik Arnold, Errol Soriano, *THE RECENT EVOLUTION OF EXPERT EVIDENCE IN SELECTED COMMON LAW JURISDICTIONS AROUND THE WORLD* (2013).

⁶⁵⁴ *R v. J-LJ.*, (2000) 2 RCS 600.

⁶⁵⁵ *White Burgess Langille Inman v. Abbott and Haliburton Co.*, 2015 SCC 23, para 45.

⁶⁵⁶ *Id.* para I.

⁶⁵⁷ *Ibid.*

⁶⁵⁸ *R v. Mohan*, (1994) 2 SCR 9.

⁶⁵⁹ [2007] 1 SCR 239, 260.

⁶⁶⁰ *Id.* para 32; Emma Cunliffe & Gary Edmond, *Justice without Science? Judging the Reliability of Forensic Science in Canada*, 99 CAN. B. REV. 65 (2021).

⁶⁶¹ John A Olah, *A Road Map to the Admissibility of Expert Evidence: White Burgess Langille Inman v. Abbott and Haliburton*, <https://www.beardwinter.com/content/uploads/1451925100ARoadMaptotheAdmissibilityofExpertEvidence.pdf> (last visited on Jan. 25th, 2022) p 5.

⁶⁶² Glancy, Graham D., and J. M. Bradford, *The admissibility of expert evidence in Canada*, 35(3) THE JOURNAL OF THE AMERICAN ACADEMY OF PSYCHIATRY AND THE LAW 350-356 (2007).

judicial decision.⁶⁶³ The court held that guidelines provided in the *Daubert* judgment could be a helpful tool in evaluating novel scientific techniques, even though these guidelines were laid down in relation to the rules of evidence in the U.S.⁶⁶⁴

The Supreme Court of Canada, in *White Burgess Langille Inman v. Abbott and Haliburton Co.*,⁶⁶⁵ devised an efficient approach to fulfil the gatekeeping role. The gatekeeping job has been split into two parts by the court. Relevancy, requirement, applicability of exclusionary rules and expertise are examined in the first step of admissibility testing. At the second stage, the judge weighs all of the possible risks and advantages of admitting expert evidence. In this manner, the threat of expert evidence may be successfully handled. This approach can save a judge from being a mechanical gatekeeper and filter out the evidence that is potentially unfit.

Trial judges have made tremendous efforts to serve as efficient gatekeepers, but despite this, questionable expert evidence may be admitted if the standards for assessing admissibility are relatively low. The rules of admissibility are susceptible to interpretation and may be interpreted differently by several judges.⁶⁶⁶ For instance, the evaluation of the reliability of a drug recognition evaluation test in the case of *R v. Bingley*⁶⁶⁷ has been criticised as superficial. The majority of judges in the case held that the test is reliable because it has been endorsed by the parliament by way of resolution.⁶⁶⁸ On the other hand, the dissenting opinion of the minority judges and in view of several scholars, such evaluation of reliability is inaccurate.⁶⁶⁹ It was contended that a test could not be held to be reliable without the proof of reliability of the underlying science.⁶⁷⁰ The endorsement by the parliament is sufficient for the use of the technique for investigation purposes only as that involves less serious consequences as compared to use in trial as evidence.

⁶⁶³ *R. v. J.-L.J.*, 2000 SCC 51 (Can.).

⁶⁶⁴ *Id.*, para 33.

⁶⁶⁵ 2015 SCC 23.

⁶⁶⁶ Bubela, Tania M., *Expert evidence: the ethical responsibility of the legal profession*, 41 Alta. L. Rev. 853, 869-870 (2003).

⁶⁶⁷ (2017) 1 S.C.R.

⁶⁶⁸ *Id.* para 26.

⁶⁶⁹ *Id.* para 38.

⁶⁷⁰ *Id.*; Chin, Jason M., and Helena Likwormik, *R v Bingley and the Importance of Scientifically Guided Legal Analysis*, 43 Queen's LJ 17 (2017).

3.2.5.3 DUTIES OF EXPERT

Explanatory guidelines on the role of expert witnesses have been issued by a large number of provinces and territories throughout Canada.⁶⁷¹ An expert witness primarily has an obligation to the court, which is reflected in several court regulations.⁶⁷² The expert shall owe an overriding duty to be impartial to the court. This duty takes precedence over the expert's duty or allegiance to the retaining party.⁶⁷³ He shall not come to the court as counsel for the party. The Supreme Court of Canada has emphasised on the importance of the expert's obligation to be objective, independent, and unbiased.⁶⁷⁴ Objectivity means an impartial evaluation of the problems at hand. And, independent opinion refers to an uninfluenced opinion by whoever has engaged him or the result of litigation.⁶⁷⁵ An opinion that is not influenced by personal prejudice is called objective, it is not biased in favour of one side over the other.⁶⁷⁶ The acid test of independence, impartiality, and absence of biasness is to see if the expert opinion would change if the other party to the case had retained him.⁶⁷⁷ An expert who does not fulfil these obligations to the court is unfit to be an expert witness. Rule 52.2 (2) specifically provides that failure to comply with the duties of an expert evidence may be excluded. As a result, an expert must be aware of this obligation and be prepared to fulfil it. An expert's evidence should be excluded if he or she fails to achieve this minimum standard.⁶⁷⁸

An important point to note here is that, in most of the provinces in Canada, breach of duty by an expert is related to the admissibility of the opinion.⁶⁷⁹ For example, if the expert has such an interest in the litigation or such is the relationship with the retaining party that he cannot be perceived as independent, impartial, and unbiased, his opinion cannot be admitted in case as expert opinion.⁶⁸⁰ Likewise, the opinion of an expert who is also the father of the retaining party cannot be admitted as expert opinion.⁶⁸¹ Thus an

⁶⁷¹ *White Burgess Langille Inman v. Abbott and Halburton*, 2015 SCC 23, para 28.

⁶⁷² *Id.* para 26.

⁶⁷³ *Id.* para 32.

⁶⁷⁴ *Id.* para 32.

⁶⁷⁵ *Id.* para 32.

⁶⁷⁶ *Id.* para 32.

⁶⁷⁷ *Id.* para 32.

⁶⁷⁸ *Id.* para 10.

⁶⁷⁹ *Id.* para 40.

⁶⁸⁰ *Fellowes, McNeil v. Kansa General International Insurance Co.* (1998), 40 O.R. (3d) 456 (Gen. Div.); *Royal Trust Corp. of Canada v. Fisherman* (2000), 49 O.R. (3d) 187 (S.C.J.).

⁶⁸¹ *R. v. Docherty*, 2010 ONSC 3628.

expert is required to meet a basic threshold of independent and impartiality as a condition for admissibility.⁶⁸² This is in consonance with the basic structure of evidence law in Canada and the Supreme Court’s ruling that “the admissibility of the expert evidence should be scrutinized at the time it is proffered, and not allowed too easy an entry on the basis that all of the frailties could go at the end of the day to weight rather than admissibility.”⁶⁸³

This makes it evident that the duties of an expert are taken very seriously. Though, the Supreme Court notes that meeting a basic threshold shall not be too onerous for the expert.⁶⁸⁴ Further, there are explicit rules in British Columbia, Nova Scotia, Ontario, Saskatchewan, Quebec, and Prince Edward Island that require an expert to certify in court that they are conscious of their primary duty toward the courts and are willing to comply with that duty.⁶⁸⁵

For the judge to assess an expert report, it is required that the report shall include expert qualifications, code of conduct certification, facts underlying the report, reasoning that forms the basis of the conclusions, the literature that has been relied on, a summary of the methods used, limitations and shortcomings of the report, and the expert’s relationship with the party summoning him.⁶⁸⁶

3.2.5.4 COURT-APPOINTED EXPERT

It is possible to alleviate worries about incompetent experts and shoddy practices by using court-appointed experts.⁶⁸⁷ Appointment of court-appointed experts promotes objectivity in expert evidence.⁶⁸⁸ The rules regulating evidence are flexible enough to allow judges to appoint experts to evaluate the trustworthiness of the expert evidence.⁶⁸⁹

⁶⁸² *White Burgess Langille Inman v. Abbott and Halburton*, 2015 SCC 23, para 54.

⁶⁸³ *R v. J-LJ*, (2000) 2 RCS 600, para 28.

⁶⁸⁴ *Id.* para 49.

⁶⁸⁵ Saskatchewan Queen’s Bench Rules, r. 5-37(3); British Columbia Supreme Court Civil Rules, r. 11-2(2); Ontario Rules of Civil Procedure, r. 53.03(2.1); Nova Scotia Civil Procedure Rules, r. 55.04(1)(a); Prince Edward Island Rules of Civil Procedure, r. 53.03(3)(g).

⁶⁸⁶ Federal Court Rules, Rule 52.2.

⁶⁸⁷ Alexandra CC Derwin, *The Judicial Admission of Faulty Scientific Expert Evidence Informing Wrongful Convictions*, (3) UWO J. Leg. Stud. 13 (2018).

⁶⁸⁸ Bubela, Tania M., *Expert evidence: the ethical responsibility of the legal profession*, 41 Alta. L. Rev. 853, 869-870, 863 (2003).

⁶⁸⁹ Bubela, Tania M., *Expert evidence: the ethical responsibility of the legal profession*, 41 Alta. L. Rev. 853, 869-870, 870 (2003).

3.2.5.5 TAKE AWAY POINTS

Canadian legal jurisprudence places greater emphasis on the duties of an expert than other jurisdictions. To the extent that a failure to comply with the duties of an expert would render the expert opinion inadmissible. Certain provinces in Canada have express provisions in this regard.⁶⁹⁰ Also, the rules in British Columbia, Nova Scotia, Quebec, Saskatchewan, Ontario, Prince Edward Island, and the Federal Courts necessitate that the experts shall certify that they are well aware of their duty to the court and are willing to fulfil this duty.⁶⁹¹ Bringing the duties of an expert to the limelight has a direct impact on the quality of the expert evidence. It eliminates the root cause of the menace of wrongful convictions. Similar provisions ought to be made part of the Indian legal framework.

3.2.6 SOUTH AFRICA

The legal system in South Africa is a mix of practices and rules borrowed from England, Wales, Holland, and local customs.⁶⁹² That is why the legal system in South Africa is also referred to as a hybrid or mixed common law system.⁶⁹³ Though, the rules relating to procedure and evidence have been majorly adopted from English Law.⁶⁹⁴

Trial by jury has been abolished in South Africa,⁶⁹⁵ yet certain features of a jury trial have been retained,⁶⁹⁶ such as rules of exclusion and regulation of expert evidence. These rules were meant to safeguard the jury from placing undue reliance on expert evidence.⁶⁹⁷ Even after the abolition of the jury system, these rules have been retained.⁶⁹⁸

⁶⁹⁰ *The Queen's Bench Rules* (Saskatchewan), r. 5-37; *Supreme Court Civil Rules*, B.C. Reg. 168/2009, r. 11-2(1); *Rules of Civil Procedure*, R.R.O. 1990, Reg. 194, r. 4.1.01(1); *Rules of Court*, Y.O.I.C. 2009/65, r. 34(23); *An Act to establish the new Code of Civil Procedure*, art. 22.

⁶⁹¹ *Saskatchewan Queen's Bench Rules*, r. 5-37(3); *British Columbia Supreme Court Civil Rules*, r. 11-2(2); *Ontario Rules of Civil Procedure*, r. 53.03(2.1); *Nova Scotia Civil Procedure Rules*, r. 55.04(1)(a); *Prince Edward Island Rules of Civil Procedure*, r. 53.03(3)(g); *An Act to establish the new Code of Civil Procedure*, art. 235 (not yet in force); *Federal Courts Rules*, SOR/98-106, r. 52.2(1)(c).

⁶⁹² Lirieka Meintjes-Van der Walt, *Ruling on Expert Evidence in South Africa: A Comparative Analysis*, 5 Int'l J. Evidence & Proof 228 (2001) fn11.

⁶⁹³ McKnight, Joseph, *Some historical observations on mixed systems of law*, 22 Juridical Rev, 177 (1977).

⁶⁹⁴ *Ibid.*

⁶⁹⁵ Abolition of Juries, Act 34 of 1969, s. 7.

⁶⁹⁶ Lirieka Meintjes-Van der Walt, *Ruling on Expert Evidence in South Africa: A Comparative Analysis*, 5 Int'l J. Evidence & Proof 226 (2001).

⁶⁹⁷ Edmond, G. and Meintjes-Van der Walt, L., *Blind justice? Forensic science and the use of closed circuit television images as identification evidence in South Africa*, 131(2) South African Law Journal 109,111 (2014).

⁶⁹⁸ *Ibid.*

Another feature similar to the jury system is the use of assessors. Assessors are comparable to jurors.⁶⁹⁹ They act as co-finders of facts and assist the court in findings relating to facts.⁷⁰⁰ Assessors are meant to provide assistance to the judge.⁷⁰¹ Same as in Uganda, where the judge shall invite assessors for assistance in criminal cases.⁷⁰² These are people with specialised skills and knowledge in a special field.⁷⁰³ But they are not given the power to make judicial determinations.⁷⁰⁴

3.2.6.1 ADMISSIBILITY OF EXPERT EVIDENCE

1. Relevant – In accordance with common law rules, the evidence must be relevant to the determination of the case to be admissible in court. This requirement is explicitly provided in Section 210 of the Criminal Procedure Act⁷⁰⁵ and Section 2 of the Civil Proceedings Evidence Act⁷⁰⁶ for criminal and civil cases.⁷⁰⁷ Thus, all evidence, including expert evidence, shall be relevant to the case in order to be admitted in court.

2. Appreciable assistance – In the case of *Gentiruco AG v Firestone SA (Pty) Ltd*, it was held that 'the real and practical test of an expert witness's admission is whether the court can get it "appreciable assistance" on that specific issue from that witness.'⁷⁰⁸ The term "appreciable assistance" is comparable to terms such as "necessity, helpfulness and capacity to assist" that are used in the context of other jurisdictions. They all mean the same thing i.e. the evidence shall be of some use to the court in deciding the case. Expert evidence is primarily opinion evidence. It is made admissible in court if it is helpful to

⁶⁹⁹ Lawrence Helman and Andréa Pekeur, *Legal systems in South Africa: overview*, PRACTICAL LAW [https://uk.practicallaw.thomsonreuters.com/w-030-7871?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/w-030-7871?transitionType=Default&contextData=(sc.Default)&firstPage=true) (last visited Aug. 29th, 2022).

⁷⁰⁰ eNCA, <https://www.enca.com/south-africa/crucial-role-court-assessor> (last visited Jan. 26th, 2022).

⁷⁰¹ Hrown Douglas, *Criminal Procedure in Uganda and Kenya*, (2) London Sweet and Maxwell 137 (1970).

⁷⁰² Section 3, The Trial on Indictments Act of 1971.

⁷⁰³ Asiimwe, Medard, *A critical analysis of the role of court assessors in the administration of justice in Uganda: a case study of the criminal division of the High Court of Uganda*, 1 (2018) <https://ir.kiu.ac.ug/bitstream/20.500.12306/9899/1/Asiimwe%20Medard.pdf> (last visited Sept. 14th, 2022).

⁷⁰⁴ *Ibid.*

⁷⁰⁵ Criminal Procedure Act 51 of 1977.

⁷⁰⁶ Civil Proceedings Evidence Act 25 of 1965.

⁷⁰⁷ *Association of Amusement and Novelty Machine Operators v. Minister of Justice*, 1980 (2) SA 636 (A) 660E.

⁷⁰⁸ 1972 (1) SA 589 (A) at 616H.

the court in deciding a fact in issue.⁷⁰⁹ As regards the degree of helpfulness, it is required that expert evidence shall have to be sufficiently helpful to be admissible.⁷¹⁰ Otherwise, if the court is not rendered much help by virtue of the expert evidence, the expert evidence would not be admitted to court on the ground of it being unhelpful.⁷¹¹ Such evidence is considered to have no probative value.⁷¹² Another reason for not admitting evidence that is not sufficiently helpful is that such evidence may cause confusion and complication.⁷¹³ The decision regarding the helpfulness of expert evidence comes within the purview of judge's discretion.⁷¹⁴

3. Expertise – Another condition for the admission of evidence in court is that the expert shall satisfy the court about the sufficiency of his expertise, which could be gained through training or experience.⁷¹⁵ The expert need not be professionally educated.⁷¹⁶ The required skill could be gained by virtue of his experience. The sufficiency of expertise is determined by keeping in view the proffered evidence.⁷¹⁷ For instance, in the case of *Mohamed v. Shaikh*,⁷¹⁸ the Supreme Court of Appeal of South Africa held that being a general medical practitioner is not a sufficient qualification to proffer evidence concerning the fertility of semen.

3.2.6.2 GATEKEEPING FUNCTION

An expert does not have the authority to usurp the adjudicatory function of the court.⁷¹⁹ It means that experts shall not give opinions on issues that the court shall decide. The Supreme Court of Appeal of South Africa, in the case of *Holtzhausen v Roodt*,⁷²⁰

⁷⁰⁹ Annari Faurie, *The Admissibility and Evaluation of scientific Evidence in Court*, (2000) https://uir.unisa.ac.za/bitstream/handle/10500/16774/dissertation_faurie_a.pdf?sequence=1&isAllowed=y (last visited Jun. 13th, 2022).

⁷¹⁰ Lawrence Helman and Andréa Pekeur, *Legal systems in South Africa: overview*, PRACTICAL LAW (26th Jan., 2022) [https://uk.practicallaw.thomsonreuters.com/w-030-7871?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/w-030-7871?transitionType=Default&contextData=(sc.Default)&firstPage=true) (last visited Aug, 29th, 2022).

⁷¹¹ *Holtzhausen v Roodt*, 1997 (4) SA 766 (W) 776F).

⁷¹² *Helen Suzman Foundation v President of the Republic of South Africa and Others; Glenister v President of the Republic of South Africa and Others* (CCT 07/14, CCT 09/14) [2014] ZACC 32, para 30.

⁷¹³ 1997 (4) SA 766 (W) at 772C-D.

⁷¹⁴ *Ibid.*

⁷¹⁵ *Menday v Protea Insurance Co Ltd.*, 1976 (1) SA 565 (E) at 579.

⁷¹⁶ Lirieka Meintjes-van der Walt, *The Proof of the Pudding: The Presentation and Proof of Expert Evidence in South Africa*, 47 J. Afr. L. 88 (2003).

⁷¹⁷ *S v Nangatuula*, 1974 (2) SA 165 (SWA).

⁷¹⁸ 1978 (4) SA 523 (N); See also *Mncube v. Cash Paymaster Services*, (1997) 5 BLLR 639 (CCMA).

⁷¹⁹ *Holtzhausen v Roodt*, 1997 (4) SA 766 (W) at 772C – 773C.

⁷²⁰ 1997 4 SA 766 (W) 772E-G.

emphasised the role of the judge as gatekeeper. The court held that “the expertise of the witness should not be elevated to such an extent that the court loses sight of its own capabilities and responsibilities in drawing inferences from the evidence.” Thus, the court has the authority and responsibility to infer the actual probative worth of the expert evidence. The court is never bound by the opinion of an expert.⁷²¹ For expert evidence to be considered in evidence, the court shall be satisfied with the expertise of the expert, logical basis and the reasoning underlying his opinion.⁷²² Further, the court may disagree with the findings of an expert based on reasons and material in support.⁷²³ The court evaluates evidence in two stages:

1. by establishing its admissibility; and
2. by evaluating all accepted evidence.⁷²⁴

The division of expert evidence assessment into two stages is similar to the Canadian approach.⁷²⁵ Any evidence erroneously accepted at the first stage may simply be excluded at the second stage.⁷²⁶ According to the free proof principle, triers of fact can admit any evidence that is adequately relevant without resorting to strict exclusionary criteria. In South African trials, a rigorous application of the exclusionary rules such as 'common knowledge rule' is no longer necessary.⁷²⁷ There is less incentive for trial judges to act as gatekeepers.⁷²⁸ From the case laws, it appears that there is no serious scrutiny of the cogency of expert evidence by the court. If the other party does not challenge the expert evidence, the evidence is readily accepted by the court.⁷²⁹ For instance, in the case of *Seyisi v The State*⁷³⁰ the Supreme Court of Appeal allowed the admission of fingerprint expert on the ground that the experts or the basis of the expert

⁷²¹ Lirieka Meintjes-van der Walt, *The Proof of the Pudding: The Presentation and Proof of Expert Evidence in South Africa*, 47 J. Afr. L. 88, 89 (2003).

⁷²² *Menday v Protea Assurance Co., Ltd* 1976 (1) SA 565 (ECD), p 569B – C.

⁷²³ *AB v BG*, [2009] EWCA Civ 10.

⁷²⁴ Alistair Price, *Dealing with Differences: Admitting Expert Evidence to Stretch Judicial Thinking beyond Personal Experience, Intuition and Common Sense*, 19 S. Afr. J. Crim. Just. 141,147 (2006).

⁷²⁵ Discussed in section 3.2.5.2.

⁷²⁶ Alistair Price, *Dealing with Differences: Admitting Expert Evidence to Stretch Judicial Thinking beyond Personal Experience, Intuition and Common Sense*, 19 S. Afr. J. Crim. Just. 141 (2006).

⁷²⁷ Lirieka Meintjes-Van der Walt, *Ruling on Expert Evidence in South Africa: A Comparative Analysis*, 5 Int'l J. Evidence & Proof 226 (2001).

⁷²⁸ L. Meintjes-Van der Walt, *A Few Plain Rules? A comparative perspective on exclusionary rules of expert evidence in South Africa*, 64 THRHR 236,238 (2001).

⁷²⁹ *S v Ncube & others* 2011 (2) SACR 471 (GSJ); Lirieka Meintjes-van der Walt, *The Proof of the Pudding: The Presentation and Proof of Expert Evidence in South Africa*, 47 J. Afr. L. 88, 104 (2003).

⁷³⁰ [2012] ZASCA 144.

evidence was not challenged by the opposite counsel. The court rejected the contention of the opposite counsel that the expert evidence shall not be accepted unless an explanation of the points of similarities is presented and the court is personally satisfied with the explanation.⁷³¹ The court also endorsed the judgment of the lower court. The lower court had also admitted the evidence of the expert, holding that expertise is the prima facie proof of the evidence.⁷³² And, thereafter it is the duty of the opposing counsel to rebut the credibility of the expert evidence.⁷³³

Further, reliability is not a condition for the admission of expert evidence in court.⁷³⁴ Reliability of scientific evidence is often considered when deciding the weight to be given to the evidence and not at the stage of admission of evidence to court. The inquiry at the time of the admission of expert evidence is limited to relevancy, helpfulness, and proof of expertise.⁷³⁵

3.2.6.3 DUTIES OF AN EXPERT

The primary duty of the expert is towards the court and not to the party calling him to court.⁷³⁶ He is duty-bound to assist the court on matters that require his expertise.⁷³⁷ Further, he should present his evidence in court objectively without favouring either party to the case. The objective presentation of opinion is the chief duty of an expert.⁷³⁸ Expert evidence is considered worthless if the expert does not appear to be neutral in his opinion.⁷³⁹ Thus, objectivity of the expert opinion is one of the main prerequisites.⁷⁴⁰ An opinion that is not neutral/objective is not useful to the court and is, therefore, of little value.⁷⁴¹ The expert evidence may be disregarded if the court finds that the opinion is not objective, reasoned, or impartial.⁷⁴²

⁷³¹ *Id.* para 13.

⁷³² *Id.* para 12.

⁷³³ *Id.* para 12.

⁷³⁴ Adebola Olaborede & Lirieka Meintjes-Van der Walt, *The Dangers of Convictions Based on a Single Piece of Forensic Evidence*, 23 POTCHEFSTROOM ELEC. L.J. 1,11 (2020).

⁷³⁵ R. May, *Criminal Evidence*, 4th ed. (Sweet & Maxwell: London, 1999) 166.

⁷³⁶ Lirieka Meintjes-van der Walt, *The Proof of the Pudding: The Presentation and Proof of Expert Evidence in South Africa*, 47 J. Afr. L. 88, 92 (2003).

⁷³⁷ *Ibid.*

⁷³⁸ Judge Neels Claassen, *Expert Medical Evidence A Judge's Perspective*, <https://samla.co.za/wp-content/uploads/2020/06/EXPERT-MEDICAL-EVIDENCE-Judge-Neels-Claassen.pdf> (Jan. 26th, 2022).

⁷³⁹ *Jacobs v Transnet Ltd t/a Metrorail*, 2015 (1) SA 139 (SCA) par [14].

⁷⁴⁰ *Ibid.*

⁷⁴¹ *Stock v Stock*, 1981 (3) SA 1280 (A) at 1296F.

⁷⁴² *JSI Shipping (S) Pty Ltd v Teofoongwonglcloong (a firm)*, [2007] SGCA 40.

The expert report presented to the court shall state the fact and reasoning on which the expert opinion is based.⁷⁴³ It is an essential duty of an expert. The reasoning presented by an expert enables the court to evaluate the strength of the expert findings.⁷⁴⁴ Strength of the reasoning of expert opinion increases its probative worth.⁷⁴⁵ The reasoning of an expert report is not evaluated as a rule of admissibility, rather it is considered at the time of the weighing of evidences.⁷⁴⁶ The expert shall also provide the court with other possible opinions or views that may differ from the opinion presented by him as evidence in court.⁷⁴⁷

High standards of objectivity and accuracy are expected from the expert report as expert evidence tends to carry more weight in the eyes of the adjudicator.⁷⁴⁸ Yet, no guidelines or directives have been laid down for the application of these high standards.⁷⁴⁹

3.2.6.4 COURT-APPOINTED EXPERT

Section 186 of the Criminal Procedure Act gives the court the power to summon a witness if the court considers it as “essential to the just decision of the case.” The section does not contain a direct or explicit provision for the court-appointed expert. Yet, it empowers the court to appoint an expert as a witness under this section whenever needed.⁷⁵⁰ The discretionary authority to summon a witness becomes an obligation if it seems that the witness's testimony is critical to the case's fair resolution. The Supreme Court of Appeal, in *S v Gerbers*,⁷⁵¹ held that all judicial officials must always keep in mind that the power under section 186 shall be exercised in good faith.

⁷⁴³ *Coopers (South Africa) (Pty) Ltd v. Deutsche Gesellschaft für Schädlingsbekämpfung MbH*, 1976 (3) SA 352(A).

⁷⁴⁴ *Ibid.*

⁷⁴⁵ *S v. Ramgobin and Others*, 1986 (4) SA 117 (NPD).

⁷⁴⁶ *The Role of Forensic Expert Evidence in Establishing Criminal Incapacity*, <https://repository.up.ac.za/bitstream/handle/2263/29194/04chapter4.pdf?sequence=5&isAllowed=y> (last visited Jun. 13, 2022).

⁷⁴⁷ Grobler S “sc”, *XIth Controversies and Problems in Surgery Symposium* 11 – 12 (Pretoria 20 October 2006).

⁷⁴⁸ *Holtzhausen v Roodt*, 1997 (4) SA 766 (W) at 768B.

⁷⁴⁹ Edmond, G. and Meintjes-Van der Walt, L., *Blind justice? Forensic science and the use of closed-circuit television images as identification evidence in South Africa*, 131(2) South African Law Journal 109,113 (2014).

⁷⁵⁰ Annari Faurie, *The Admissibility and Evaluation of scientific Evidence in Court*, (2000) https://uir.unisa.ac.za/bitstream/handle/10500/16774/dissertation_faurie_a.pdf?sequence=1&isAllowed=y (last visited Jun. 13th, 2022), p 109.

⁷⁵¹ [1997] 3 All SA 61 (A), para 12.

3.2.6.5 TAKE AWAY POINTS

The legal framework and practices in South Africa concerning expert evidence is basically identical to that in India. Accordingly, the issues connected to the misapplication for forensic evidence are also comparable. *Adebola Olaborede & Lirieka Meintjes-Van der Walt* have voiced their worries in the following words – ‘the South African legal system has much to learn from the admissibility criteria set out in *Daubert*.’⁷⁵² The authors also plead for the imposition of a reliability threshold as a condition precedent to the admission of expert evidence to save the system from making judicial errors. Reliance on proof of expertise to assess the credibility of expert evidence does not safeguard the courts against misleading and unreliable evidence.⁷⁵³ Such arguments fortify the claim that a system lacking a reliability test is prone to making mistakes pertaining to forensic evidence. South Africa, as a legal system, might be considered as a jurisdiction that confronts identical difficulties as India. The study of South African legal practices highlights how a comparable common law jurisdiction is failing to react to the difficulties presented by the wrongful application of forensic science. There may not be something to adopt or borrow from South African laws and legal processes. Yet, the study of South Africa’s legal practices strengthens the argument that, in a legal system which is bereft of specific statutory reliability tests the possibility of misapplication of forensic evidence is high. Further, in the context of South Africa, it is recommended by scholars that reliability standards adopted in U.S., Canadian courts, and the Law Commission of U.K. shall be incorporated in the legal framework.⁷⁵⁴ This also lends credence to similar recommendations made in the present study in the context of India.

3.2.7 SINGAPORE

Since Singapore was a British colony, the legal system is founded on common law.⁷⁵⁵ In Singapore, the judge is the ultimate adjudicator of both law and fact. In 1970, the jury

⁷⁵² Adebola Olaborede & Lirieka Meintjes-Van der Walt, *The Dangers of Convictions Based on a Single Piece of Forensic Evidence*, 23 Potchefstroom ELEC. L.J. 1, 11 (2020).

⁷⁵³ Edmond, G. and Meintjes-Van der Walt, L., *Blind justice? Forensic science and the use of closed-circuit television images as identification evidence in South Africa*, 131(2) South African Law Journal 109,146 (2014).

⁷⁵⁴ *Id.* at 148.

⁷⁵⁵ *Introduction to Singapore’s Legal System*, GUIDE ME SINGAPORE (Jan. 27th, 2022), <https://www.guidemesingapore.com/business-guides/immigration/get-to-know-singapore/introduction-to-singapores-legal-system> (last visited Aug. 29th 2022).

system was completely abolished.⁷⁵⁶ The scheme of evidence law is such that statutory law and the common law principles both apply. Only those common law rules of evidence that are in conflict with the legislated rules of evidence are repealed by the Evidence Act.⁷⁵⁷ The Evidence Act does not abolish common law rules that are not in conflict with it.⁷⁵⁸

3.2.7.1 ADMISSIBILITY OF EXPERT EVIDENCE

The fundamental legal provision governing expert evidence in Singapore is section 47 of the Evidence Act. This section lays down conditions for the admission of expert evidence in court. These conditions are:

1. Relevant – Relevancy is the first and foremost requirement for admitting any evidence in court, including expert evidence. Section 5 of the Evidence Act⁷⁵⁹ provides that ‘Evidence may be given in any suit or proceeding of the existence or non-existence of every fact in issue and of such other facts as are hereinafter declared to be relevant, and of no others.’ Thus, no expert evidence is permitted unless it is declared relevant for the determination of the case. And, as per section 47(1)⁷⁶⁰ expert evidence is relevant if it could be of assistance to the court on matters that require specialised knowledge.
2. Court likely to derive assistance from expert evidence – Prior to the 2012 amendment to the evidence act, expert evidence was admissible if it was considered ‘necessary’ for the adjudication of case.⁷⁶¹ This has been replaced by the phrase “like to derive assistance” in sub-section (1) of Section 47. The intention of the legislation underlying this change was to broaden the scope of expert evidence.⁷⁶² As opposed to the narrow language "necessary," "likely to drive assistance" indicates a less definite and categorical need. 'Like to drive assistance' gives the impression that the court

⁷⁵⁶ SINGAPORE LAW WATCH, <https://www.singaporelawwatch.sg/About-Singapore-Law/Overview/ch-01-the-singapore-legal-system> (last visited Jan. 27th, 2022).

⁷⁵⁷ The Evidence Act, 1893 (Singapore) (Original Enactment: Ordinance 3 of 1893).

⁷⁵⁸ Law Reform Committee, Singapore Academy of Law, *Report of the Law Reform Committee on Opinion Evidence* (October 2011) p 6.

⁷⁵⁹ Evidence Act, 1893 (Singapore).

⁷⁶⁰ *Ibid.*

⁷⁶¹ Wong, Ronald JJ., *Judging between conflicting expert evidence: Understanding the scientific method and its impact on apprehending expert evidence*, 26(1) SINGAPORE ACADEMY OF L. J. 169-214, 175 (2014).

⁷⁶² *Id.* p 176.

might/might not benefit from expert testimony. The need for expert evidence is not required to be certain for the admission of expert evidence. As a result, the court is free to accept expert testimony, the usage of which is not certain.

3. Subject matter of expert evidence – An opinion based on scientific, technical, or other specialised knowledge is admissible as per sub-section (2) of Section 47.⁷⁶³ It is hard to anticipate and determine all the conceivable areas of expert evidence. Phrases like "specialised knowledge" have been employed to cover the widest possible subjects.⁷⁶⁴ Sub-section (3) of section 47 states that no opinion is inadmissible because it is based on widely available knowledge or can be considered a matter of common knowledge. This further broadens the range of instances in which a judge may seek the opinion of an expert.⁷⁶⁵ The 2012 amendment to the law was intended to expand the categories of admissible expert evidence.⁷⁶⁶ This was the result of the legislature's faith in the court's capacity to appreciate the subtleties of expert evidence and accord appropriate weight to it. For example, evidence relating to an accident reconstruction may be admitted as expert evidence in court, although judges may have a general understanding of the issue.⁷⁶⁷

4. Expert shall have the required expertise – Expert's area of knowledge must also be established. Thereafter, it shall be enquired if the witness is an expert in that subject. It is necessary to show that a witness has the knowledge and experience required to be considered an expert witness by the court. Thus, an expert witness whose opinion is based on his expertise is only acceptable. Experts are not allowed to provide opinion testimony on subject matter that is beyond their expertise.⁷⁶⁸ Section 47(2)⁷⁶⁹ categorically mandates that an expert shall have expertise or expert knowledge which

⁷⁶³ Evidence Act, 1893 (Singapore).

⁷⁶⁴ Law Reform Committee, Singapore Academy of Law, *Report of the Law Reform Committee on Opinion Evidence* (October 2011) p 40.

⁷⁶⁵ Wong, Ronald JJ., *Judging between conflicting expert evidence: Understanding the scientific method and its impact on apprehending expert evidence*, 26(1) SINGAPORE ACADEMY OF L. J. 169-214, 177 (2014).

⁷⁶⁶ *Id.* at 178.

⁷⁶⁷ Jeffrey Pinsler, *Expert Evidence and Adversarial Compromise*, 27 SACLJ 55, 62 (2015).

⁷⁶⁸ Law Reform Committee, Singapore Academy of Law, *Report of the Law Reform Committee on Opinion Evidence* (October 2011) p 42.

⁷⁶⁹ Evidence Act, 1893 (Singapore).

could be gained through learning or experience. Likewise, O 40A r 2(1) of the Rules of Court requires an expert to provide evidence that relates to his areas of expertise only.⁷⁷⁰

3.2.7.2 GATEKEEPING FUNCTION

Lawmakers have put a great deal of trust in the judges' capacity to serve as efficient gatekeepers. At the same time, court is not bound by an expert report and has the authority to assess and scrutinize the report, even if the report has not been contradicted.⁷⁷¹

The scope of expert evidence legislation was expanded on the basis of the belief that judges could distinguish between credible and faulty evidence.⁷⁷² But, the amended law did not provide any safeguards or guidelines, such as the *Daubert* guidelines, to help judges assess the reliability of expert evidence.⁷⁷³ The courts are expected to implement safeguards that are in commensuration with technological advancements.⁷⁷⁴ The 2012 amendment resulted in the adoption of a new standard for eliminating relevant expert opinion evidence.⁷⁷⁵ The amendment provided that the admission of expert evidence may be limited by section 47(4) that allows the court to exclude expert evidence if it would be “in the interests of justice.” This provision is an explicit form of the Court's inherent authority to reject prejudicial evidence. The amendment has brought about a meaningful balance between useful expert evidence and the danger of providing unreliable evidence. The overall effect of these changes was that the courts have a wider and also structured discretion to handle expert evidence. The amendment has not brought into effect what was previously not permitted but has only made explicit the courts implied discretion to sift through the evidence as per the interests of justice. “In the interest of justice” presumably, refers to expert evidence that is “unfairly prejudicial, misleading, or confusing, or would cause or result in an undue waste of time”⁷⁷⁶

⁷⁷⁰ Cap 322, R 5, 2006 Rev Ed.

⁷⁷¹ *Haribo Asia Pvt Ltd. V. Aquarius Corp.*, (2021) SGHC 278, at para 122.

⁷⁷² Law Reform Committee, Singapore Academy of Law, *Report of the Law Reform Committee on Opinion Evidence* (October 2011) at para 11, page 7.

⁷⁷³ *Ibid.*

⁷⁷⁴ *Ibid.*

⁷⁷⁵ CHEN, Siyuan, *The 2012 Amendments to Singapore's Evidence Act: More Questions than Answers as Regards Expert Opinion Evidence?* 34(3) STATUTE LAW REVIEW 262-280 (2013).

⁷⁷⁶ Law Reform Committee, Singapore Academy of Law, *Report of the Law Reform Committee on Opinion Evidence* (October 2011) p 25.

Low admissions requirements seem to be the hallmark of Singapore's approach to reliability assessment. It is only at the stage of weighting that the evidence that courts look at the methodologies utilised and the degree to which a given approach was adequately evaluated for accuracy, and not at the stage of admission.⁷⁷⁷ However, as *Freckelton* notes, the requirement of expertise includes 'a duty to prevent evidence that involves fringe or spurious procedures or hypotheses that are not recognised within the relevant expert group, or are fundamentally unreliable.'⁷⁷⁸ Also it is the duty of the expert towards the court to ensure that the expert evidence is reliable.⁷⁷⁹ Failure on the part of the expert to prove the reliability of the report is critical for the admission of the expert evidence in court.⁷⁸⁰

The Law Committee of Singapore, while proposing changes to the law, argued that the word "knowledge" in the new section 47 implies a requirement of reliability.⁷⁸¹ The committee opined that the law should not spell out the criteria for determining reliability.⁷⁸² A fixed reliability test would limit the courts' ability to assess the accuracy of new and established fields of expertise.⁷⁸³ The courts shall be given the liberty to choose reliability guidelines at the admissibility stage or allow all evidence that appears reliable to be admitted and assess the reliability more deeply at the stage of weighing the evidence.⁷⁸⁴ It is believed that since Singapore does not have a jury system to be shielded from possibly erroneous expert testimony and a judge is solely responsible for determining the facts and law in a case, there is no need for filtering out unreliable evidence at a preliminary stage of the proceedings.⁷⁸⁵ Scholars have also opined that the revised section 47(2) of the Evidence Act reaffirms that reliability is a requirement for reliance on expert evidence.⁷⁸⁶

⁷⁷⁷ *Id.* at 39.

⁷⁷⁸ IAN FRECKELTON, *EXPERT EVIDENCE AND THE ROLE OF THE JURY* 15 (ABR Lexis 1994).

⁷⁷⁹ *Miya Manik v. Public Prosecutor*, (2021) SGCA 90, at para 50.

⁷⁸⁰ *Anita Damu v. Public Prosecutor*, (2020) 3 SLR 825, at para 43.

⁷⁸¹ *Id.* at 40.

⁷⁸² *Ibid.*

⁷⁸³ *Ibid.*

⁷⁸⁴ *Ibid.*

⁷⁸⁵ *Ibid.*

⁷⁸⁶ CHEN, Siyuan, *The 2012 Amendments to Singapore's Evidence Act: More Questions than Answers as Regards Expert Opinion Evidence?*, 34(3) STATUTE LAW REVIEW 262-280 (2013).

3.2.7.3 DUTIES OF AN EXPERT

An expert owes first and foremost to the court. His responsibilities to the court take precedence over his commitments to the person that summoned him to court.⁷⁸⁷ Reports from experts should include information about their qualifications, the literature used, and (where appropriate) a variety of plausible perspectives and rationales for their conclusions.⁷⁸⁸ The judge needs all of this information to do their job as gatekeeper and assess the trustworthiness of the expert evidence.

Apart from the statutory requirements, the rules established by judicial decisions regarding expert testimony must be followed. In the case of *Pacific Recreation Pvt. Ltd. v. S Y Technology Inc.*,⁷⁸⁹ the court held that the expert report should include his curriculum vitae, relevant professional or academic credentials; specialised training and experience; and the number of times the expert testified as an expert witness in legal proceedings in general and for the respective parties in particular. Further, it should contain a description of the facts supporting the expert's conclusion; the facts known to the expert to be true, the facts the expert was told to assume, and the facts assumed by the expert. These guidelines should be followed when expert testimony is presented; otherwise, the expert testimony may be given little or no evidential weight or may be excluded entirely.⁷⁹⁰

The duties of an expert are not only strictly worded but are also applied with equal rigour. There have been many instances where the expert report was discarded owing to non-compliance of duties by the expert. For instance, in the case of *Miya Manik v. Public Prosecutor*⁷⁹¹ the court refused to admit the medical report of a psychiatrist on the grounds that the report consisted of mere assertion and there was no mention of the methodology or criteria for reaching the conclusions.⁷⁹² Similarly, in the case of *Mehra Radhika v. Public Prosecutor*⁷⁹³ a medical report was discarded for being devoid of objectivity.⁷⁹⁴

⁷⁸⁷ O40A, r2.

⁷⁸⁸ O40A, r3.

⁷⁸⁹ (2008) 2 SLR(R) 491.

⁷⁹⁰ *Id.* para 89.

⁷⁹¹ (2021) SGCA 90.

⁷⁹² *Id.* para 56.

⁷⁹³ (2015) 1 SLR 96.

⁷⁹⁴ *Id.* at 68.

3.2.7.4 COURT-APPOINTED EXPERT

The courts in Singapore are empowered to appoint an expert for the assistance of the court either on its own or on the motion of either of the parties.⁷⁹⁵ In addition, the court may appoint a single joint expert to give evidence on behalf of both the parties.⁷⁹⁶ The court is expected to appoint experts under O40 r1 liberally.⁷⁹⁷

3.2.7.5 TAKE AWAY POINTS

Singapore's evolution of the law in relation to expert evidence could be of tremendous help to India. The law in Singapore was earlier the same as the law in India. The legislators in Singapore took note of the rising awareness of wrongful convictions worldwide and made the necessary changes in the law to do away with the uncertainties and inadequacies of the law.⁷⁹⁸ The Law Reform Committee embarked on a journey much like the present research. It undertook the study of laws in various common law jurisdictions, such as England, Australia, New Zealand, and Canada.⁷⁹⁹ Assessed the utility of various legal provisions and guidelines in other countries and adopted the ones that suited the legal system of Singapore. For instance, section 47(4) gives discretion to courts to exclude expert evidence that is not “in the interest of justice” – is a presumable copy of Section 135 of the Australian Uniform Acts and Section 403 of the Federal Rules of Evidence (USA).⁸⁰⁰ Such discretion is inherent in the legal framework, yet it was made explicit by way of the amendment. The amendment was intended to make this discretion a central concern for judges and eliminate the chances of wrongful use of expert evidence. A similar provision may be introduced in the Indian legal framework. Further, an express provision for a court-appointed expert may also be adopted.

⁷⁹⁵ O40 r1.

⁷⁹⁶ Singapore Legal Advice, <https://singaporelegaladvice.com/law-articles/expert-witness-use-expert-evidence-singapore/> (last visited on Sept. 10th, 2021).

⁷⁹⁷ Law Reform Committee, Singapore Academy of Law, *Report of the Law Reform Committee on Opinion Evidence* (October 2011) p 41.

⁷⁹⁸ SINGAPORE ACADEMY OF LAW, <https://www.sal.org.sg/Resources-Tools/Law-Reform/Opinion-Evidence> (last visited Feb. 3rd, 2022).

⁷⁹⁹ Law Reform Committee, Singapore Academy of Law, *Report of the Law Reform Committee on Opinion Evidence* (October 2011).

⁸⁰⁰ Wong, R.J., *Judging between conflicting expert evidence: Understanding the scientific method and its impact on apprehending expert evidence*, 26(1) SINGAPORE ACADEMY OF LAW JOURNAL 169-214,179 (2014).

3.3 WHAT INSIGHTS MAY BE DRAWN?

The following table summarises the positions/stances of different nations on certain fundamental issues and concerns relating to expert evidence. Information has been condensed in a tabular form to make it more readily understandable:

	India	USA	UK	Australia	Canada	South Africa	Singapore
Recognition of Gatekeeping function	Yes	Yes	Yes	Yes	Yes	Yes*	Yes
Reliability as condition for admissibility	Yes	Yes	Yes	No	Yes	Yes	Yes
Reasoning underlying the expert report as valuable input	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Duty of the expert to be objective	Yes	No	Yes	Yes	Yes	Yes	Yes
Provision for Court appointed expert (express of implied)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Figure 3-0-1

The present study reinforces the conclusion that expert evidence, its peculiar nature and limitations have been historically recognised in various common law countries.⁸⁰¹ It also makes abundantly clear that all major common law nations bestow on judges the role of a gatekeeper. Another common feature drawn out of this comparison is that all these countries require that the basis of the expert opinion shall be clearly elucidated in the expert report.

Most important thing to note is that a trend has been observed towards codification or refinement of the rules governing expert evidence by way of amendment. For instance, Rule 702 of the Federal Rules of Evidence (U.S.) was amended to statutorily incorporate the requirement of reliability, in England Part 19 of the Criminal Procedure Rules (duties

⁸⁰¹ Arnold, Erik, and Errol Soriano, *The Recent Evolution of Expert Evidence in Selected Common Law Jurisdictions Around the World: A Commissioned study for the Canadian Institute of Chartered Business Valuators*, Campbell Valuation Partners Limited 1 (2013).

of an expert) and 19A of the Criminal Practice Directions were enacted, and in Singapore the law was amended in 2012 to expand the scope of exclusionary rules. It shall be marked that most of these rules are not meant to introduce new principles or practices to the existing set of rules.⁸⁰² These are mere codification/formal acknowledgment of the pre-existing rules.⁸⁰³ The purpose behind codification is to give a formal status and to put more emphasis on the application of these principles and rules.⁸⁰⁴ It has been experienced in the past that explicit provision of law in relation to duties of an expert has enhanced the monitoring of expert's conduct by judges.⁸⁰⁵ The study has demonstrated that erroneous decisions owing to expert evidence are a global concern. Different jurisdictions have brought about certain suitable changes in their legal framework to safeguard the system against wrongful decisions. India can no longer afford to overlook this issue. India must incorporate the lessons learned from other countries. To sum up, the legal framework in India shall be amended to introduce provisions such as statutory reliability test, discretion to exclude prejudicial or unfair evidence, the appointment of an expert by court and the duties of an expert.

Having deliberated on the trend of codifying guidelines for the assessment of expert evidence, it is imperative to delve into the practical implications of these findings. Courts can counter the lack of codification by developing practical mechanisms. Therefore, it is crucial to assess how courts in India are conducting the evaluation of expert evidence. Given that evidence evaluation primarily takes place at the trial court level, the judgments of these courts have been scrutinized. The practical dimension of the issue cannot be ignored. To present a comprehensive understanding of the situation, this aspect will also be addressed. The subsequent chapter is dedicated to studying and analyzing the judgments of the lower courts.

⁸⁰² Arnold, Erik, and Errol Soriano, *The Recent Evolution of Expert Evidence in Selected Common Law Jurisdictions Around the World: A Commissioned study for the Canadian Institute of Chartered Business Valuators*, Campbell Valuation Partners Limited 5 (2013).

⁸⁰³ *Ibid.*

⁸⁰⁴ *Ibid.*

⁸⁰⁵ *Id.* at 21.

4.0 AN ANALYSIS OF LOWER COURT JUDGMENTS

Law is a consumer of a broad spectrum of forensic sciences⁸⁰⁶

4.1 INTRODUCTION

Richard Feynman, a Nobel laureate physicist, coined the term ‘cargo cult science’ as a reference to pseudo sciences such as voodoo, old beliefs, black magic, witch doctors, mind reading, and astrology, among others.⁸⁰⁷ Richard pleaded for complete scientific honesty, which he defined as ‘attempting to provide all the facts necessary to assist others in judging the worth of your contribution; not just the information that points in one way.’⁸⁰⁸ The present chapter deals with the analysis of judgments of the lower courts in Delhi, i.e. district court and court of sessions. The judgments of the lower courts were extracted from the website *indiankanoon.com*. The term “expert” was used as search string. The detailed description of data source, sampling, data analysis, etc. is provided in chapter 2. The following chart presented the number of analyses cases year-wise.

Table 4.1

	Total (expert)	relevant	civil	criminal
2016	774	361	42	319
2017	580	292	44	248
2018	1003	445	75	370
2019	826	353	51	302
2020	478	167	34	133
Total	3661	1618	246	1372

Figure 4-0-1

The following table presents classification of analysed cases based on the type of forensic technique involved –

⁸⁰⁶ Cooper, Sarah Lucy, *The collision of law and science: American court responses to developments in forensic science*, 33 Pace L. Rev. 234 (2013).

⁸⁰⁷ RP Feynman, *Cargo Cult Science*, 37(7) Engineering and Science 10 (1974).

⁸⁰⁸ *Id.* at 11.

Table 4.2

Year	Relevant Cases	Handwriting	Fingerprint	Ballistic	Medical	DNA	Mechanical	voice	Misce
2016	361	121	26	29	42	12	14	13	104
2017	292	82	29	26	54	13	4	4	80
2018	445	166	31	29	92	13	18	7	89
2019	353	117	22	25	63	3	22	11	90
2020	167	68	11	14	29	1	11	9	24
Total	1618	554	119	123	280	42	69	44	387

Figure 4-0-2

As shown in table 4.1, after using the search string “expert” 3661 cases were shortlisted. After going through these cases, it was found that only 1618 cases were relevant. In the remaining cases the use of the term “expert” was in some other context. For instance, the judgments that had words like “expert committee”, “M/s Expert Management”, “expert worker”, etc. were also part of shortlisted cases. These were removed from research data on preliminary analysis.

The analysis focuses on how lower court judges perform gatekeeping function. The study is limited to lower courts only because the appreciation of evidence is mainly done at the trial stage. Therefore, to extract information about the gatekeeping regarding forensic evidence in courts, an analysis of the judgments of lower courts is found to be most suitable. The chapter is divided into sections, each section deals with a particular forensic technique.

4.2 FINGERPRINT EVIDENCE

The *People v Jennings*⁸⁰⁹ is the first case on fingerprint that was reported in the year 1911. Soon thereafter, the technique gained legal acceptance by way of legal precedents.⁸¹⁰ Use of this technique for the purpose of identifying criminals was a revolutionary change in the investigation of crimes. Fingerprinting has been in usage forensically for almost a century. The time when it was introduced in legal system, forensic science was in its infancy. Consequently, this technique was subjected to very little judicial scrutiny. It was readily accepted in courts.⁸¹¹ In fact till the 1950s scant scientific research was done on

⁸⁰⁹ 252 Ill. 534, 96 N.E. 1077 (1911).

⁸¹⁰ PC Giannelli, *Daubert Challenges to Fingerprints*, Faculty Publications 155 (2006).

⁸¹¹ Simon A Cole, *Suspect Identities: A History of Fingerprinting and Criminal Identification*, Harvard University Press (2009).

fingerprint identification. Fingerprint identification, also known as Dactyloscopy, is one of the most commonly utilised forensic identification methods. Skin surface has friction ridges that are meant to facilitate gripping.⁸¹² Fingerprints are left on a surface as a result of deposition of oil on the surface when it comes in contact with friction ridges.⁸¹³ The technique involves using these prints for identifying the person to whom they belong. The generic name for the technique is Friction Ridge Analysis which refers to the examination of ridges on the surface of the hands and legs, specifically fingerprint, palm, and sole prints.⁸¹⁴ It is not limited to fingerprints, i.e., the friction skin at the distal end of the fingers and thumbs. The designs on the fingers are more complex, facilitating a clear categorisation and individualisation. Any reference to ‘fingerprint evidence’ is intended to include the more general phrase presently in use, i.e., friction ridge impression evidence. Uniqueness, permanence, inimitability, and transferability of fingerprints make them highly useful for legal purposes.⁸¹⁵ Numerous instances of erroneous fingerprint identifications⁸¹⁶ and seminal studies by authoritative organisations, such as the U.S. National Research Council, President’s Council of Advisors on Science and Technology, The American Association for the Advancement of Science, are the reasons why fingerprint identification has received widespread adverse attention in recent years. These studies have questioned the scientific basis on which fingerprint identification reports are presented in court.

The most notorious case in this regard is the case of *Brandon Mayfield*. He was erroneously arrested for the 2004 explosion in Madrid on the bases of latent fingerprint analysis solely.⁸¹⁷ One of the examiners at FBI determined that there was 100% certainty in the fingerprint match.⁸¹⁸ This was later found to be an erroneous fingerprint

⁸¹² A Campbell, *The fingerprint Inquiry Report*, 43 Edinburgh, Scotland: Aps Group Scotland 790 (2011).

⁸¹³ *US v Mitchell*, 365 F.3d 215 (3d Cir. 2004).

⁸¹⁴ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 100 (2009).

⁸¹⁵ Kavita Manchanda, *Forensic Science*, (Scribd, 28 April 2017), <https://www.scribd.com/document/346690304/Forensic-Science> (last visited Jun. 15, 2021).

⁸¹⁶ *Commonwealth v Cowans*, 756 N.E.2d 622 (Mass. App. Ct. 2001).

⁸¹⁷ Stacey RB, *Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case*, 7(1) Forensic Science Communications (2005).

⁸¹⁸ *Application for Material Witness Order and Warrant Regarding Witness: Brandon Bieri Mayfield*, In re Federal Grand Jury Proceedings 03-01, 337 F. Supp. 2d 1218 (D. Or. 2004) (No. 04-MC-9071).

comparison.⁸¹⁹ The Spanish authorities found the match to be negative.⁸²⁰ Whereas, three officials from FBI and one private examiner had claimed that it was a match.⁸²¹ The following are the print used in the case:



Latent print



Mayfield's print



Daoud's print (actual perpetrator)

Figure 4-0-3

The ACE-V method is used to analyse the prints left by the skin. Analysis, Comparison, Evaluation, and Verification – is what ACE-V stands for.⁸²² ACE-V is an abbreviation, not a technique. It is just a description of what anybody would do when analysing a latent and a potential source print.⁸²³ It is a procedure that gives a sequence of steps to be followed by an examiner.⁸²⁴ The first stage in fingerprint analysis is determining if the available ridge information is adequate for assessment on both qualitative and quantitative level. Thereafter, the examiner compares the two prints. The next stage is to determine if the concordance between the latent and chance prints is good enough and of sufficient quality to enable a conclusion. Finally, another independent examiner verifies and confirms the finding.⁸²⁵ A fingerprint examination can lead to four possible conclusions.⁸²⁶

⁸¹⁹ Emma, *Forensics Under the Microscope: Unproven Techniques Sway Courts, Erode Justice*, (Psychology and Crime News, 24 October 2004), <http://crimepsychblog.com/?p=153.s> (last visited Sept. 28, 2021).

⁸²⁰ Sandy L Zabell, *Fingerprint Evidence*, 13 J.L. & Pol'y 143 (2005).

⁸²¹ *Id.* at 170.

⁸²² Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 100 (2009).

⁸²³ Sandy L Zabell, *Fingerprint Evidence*, 13 J.L. & Pol'y 143 (2005).

⁸²⁴ A Campbell, *The Fingerprint Inquiry Report*, 43 Edinburgh, Scotland: Aps Group Scotland 790,633 (2011).

⁸²⁵ Andre A. Moenssens, *Fingerprint Identification: A Valid, Reliable Forensic Science*, 18 CRIM. Just. 30 (2003).

⁸²⁶ Stevenage, S.V. and Pitfield, C., *Fact or Fiction: Examination of the Transparency, Reliability and Sufficiency of the ACE-V Method of Fingerprint Analysis*, 267 Forensic Science Intl. 145 (2016).

1. Valueless – the quality of prints is too poor to be evaluated.
2. Match – the two prints came from the same source.
3. Excluded – the two prints have not come from the same source.
4. Inconclusive – no conclusion can be drawn by comparing the two prints.

Whatever may be the conclusion of an expert report, it shall be accompanied by reasoning in support. Simply presenting an expert's judgment in court has little significance unless it is supported by the rationale that supports the finding.⁸²⁷

Science is subject to evolution. New scientific information accumulates and supplants previously held scientific truths. If this were not the case, we would still believe that homosexuality is a mental illness, as the American Psychiatric Association categorised it until the 1970s.⁸²⁸ As the research into fingerprint identification techniques began and various studies were conducted, it was found that there is a vast difference in the manner in which forensic science is being understood/presented in the courts and the manner in which the world of forensics actually works. It is not disputed that friction ridge patterns of a person are unique and remain the same in one's lifetime.⁸²⁹ It is well established and well-accepted scientific facts that fingerprints of two people do not ever match beyond any doubt. The ridge features remain unchanged even though a total cell replacement of the hand occurs approximately every month.⁸³⁰ However, uniqueness does not imply that chance prints from two distinct individuals will always be enough dissimilar to be distinguished as originating from the same source, or that impressions formed by one finger at different times would be so similar that they can be identified as coming from a common source.⁸³¹ Impressions left by one finger may vary because of exogenous factors such as pressure applied by skin, degree of contact between the finger and the surface etc.⁸³² Chance prints show only a portion of the actual pattern and

⁸²⁷ *Ramesh Chandra Agrawal v Regency Hospital Ltd. and Ors.*, MANU/SC/1641/2009, para 15.

⁸²⁸ CK Faisal, *On the Margins with Full Equality Still out of Reach*, THE HINDU, Jun. 28, 2021, at 6.

⁸²⁹ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 136 (National Academies Press, 2009) 144.

⁸³⁰ Andre A. Moenssens, *Fingerprint Identification: A Valid, Reliable Forensic Science*, 18 CRIM. JUST. 30,32 (2003).

⁸³¹ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 136 (National Academies Press, 2009) 144.

⁸³² *Id.* at 144.

may be distorted, smudged, etc. They are generally less clear. For these reasons, these prints have the potential of leading to a wrongful conclusion, as they generally ‘contain less clarity, less content, and less undistorted information than a fingerprint taken under controlled conditions, and much, much less detail compared to the actual patterns of ridges and grooves of a finger.’⁸³³

The lack of research concerning fingerprint identification technique became widely known after the publication of a seminal report, i.e. NAS report, by the U.S. National Research Council.⁸³⁴ The report made a categorical statement that ‘the law’s greatest dilemma in its heavy reliance on forensic evidence, however, concerns the question of whether – and to what extent- there is science in any given forensic science discipline.’⁸³⁵ The report points out that as the veracity and reliability of friction ridge studies are unknown, assertions that the fingerprint examination reports have 0% error rates are scientifically implausible.⁸³⁶ Friction ridge analysis is primarily based on ACE-V as a technique. This framework is not precise enough to be considered as a tried-and-true method for identification. Since its scope is too broad to allow for consistency and testability, ACE-V cannot guarantee that two analysts using the tool will arrive at the same conclusions.⁸³⁷ As a consequence, just following the ACE-V stages does not guarantee that the technique would lead to generating reliable findings.⁸³⁸

In 2016, President’s Council of Advisors on Science and Technology (PCAST)⁸³⁹ in the United States exposed that only two adequately planned studies of latent fingerprint analysis had been done. The rate of false matches (also known as “false positives”) was found to be quite high in both of these studies: 1 in 18 and 1 in 30. The NAS and PCAST reports demand more rigorous research in forensics. Researchers and the scientific

⁸³³ Haber, Lyn and Ralph Norman Haber, *Error Rates for Human Latent Fingerprint Examiners, In Automatic Fingerprint Recognition Systems*, Springer NY 339 (2004).

⁸³⁴ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 136 (National Academies Press, 2009).

⁸³⁵ *Id.* at 87.

⁸³⁶ *Ibid.*

⁸³⁷ *Ibid.*

⁸³⁸ *Ibid.*

⁸³⁹ REPORT TO THE PRESIDENT, FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE COMPARISON METHODS, 1 (Sep, 2016).

community have challenged the statements that the fingerprint identification method is an exact science and has a zero-error rate because of the inherent flaws in the fingerprint comparison process.⁸⁴⁰ The American Association for the Advancement of Science (AAAS) has also examined the scientific soundness of fingerprint analysis. They held that ‘we have concluded that latent print examiners should avoid claiming that they can associate a latent print with a single source and should particularly avoid claiming or implying that they can do so infallibly, with 100% accuracy.’⁸⁴¹ When forensic experts say with a high degree of confidence that latent prints came from a specific individual, many publications have termed such findings “scientifically indefensible.”⁸⁴² The AAAS report says:

There is no basis for estimating the number of individuals who might be the source of a particular latent print. Hence, a latent print examiner has no sound scientific basis for concluding that the pool of possible sources is probably limited to a single person than for concluding it is certainly limited to a single person.⁸⁴³

Claims made by examiners in courts that they are able to “individualise” are not supported by scientific evidence.⁸⁴⁴ One may counter-argue that expert testimony does not have to be 100 percent certain to be admissible in court.⁸⁴⁵ Yet, the inappropriateness of claiming 100% accuracy without a scientific basis is what caused wrongful convictions. Undoubtedly, uncertainties are understandable, given the very nature of science. The problem lies with the unsupportable claims and assertions about the accuracy of the technique. The evidence should be presented truthfully to the judges so that they can correctly consider its weight. This includes both the evidence’s strengths and shortcomings.⁸⁴⁶ Testimony that specifies the limitations of the findings shall be

⁸⁴⁰ Haber, Lyn and Ralph Norman Haber, *Error Rates for Human Latent Fingerprint Examiners, In Automatic Fingerprint Recognition Systems*, Springer NY 339 (2004).

⁸⁴¹ Anne Q Hoy, *Fingerprint Source Identity Lacks Scientific Basis for Legal Certainty*, (AAAS, 14 September 2017), <https://www.aaas.org/news/fingerprint-source-identity-lacks-scientific-basis-legal-certainty> (last visited May 15, 2022).

⁸⁴² *Ibid.*

⁸⁴³ *Ibid.*

⁸⁴⁴ A Campbell, *The Fingerprint Inquiry Report*, 43 Edinburgh, Scotland: Aps Group Scotland 790,683 (2011).

⁸⁴⁵ *Id.* at 685.

⁸⁴⁶ *Id.* at 630.

admitted in courts as evidence.⁸⁴⁷ Claims should be presented in court as per the reliability of the technique and the significance of fingerprint evidence should not be exaggerated.

It is noteworthy that the scientific evaluations were not critical of using this technique for legal purposes *in toto*. When it comes to identifying suspects, latent fingerprint comparison is regarded as a helpful subjective approach. The problem arises when latent fingerprint examiners overstate the trustworthiness of the findings of their analysis. The credibility of fingerprint evidence continues to be routinely exaggerated. As a consequence, judges have been deprived of accurate information concerning evidence. In the past, fingerprint examiners failed to participate in statistical analysis and the latest validation studies because of a long-standing commitment to categorical identification.⁸⁴⁸

A fingerprint examiner's conclusion regarding individualisation of a latent print involves a series of subjective decisions.⁸⁴⁹ In fact, every single step in the ACE-V process has an element of subjectivity which can be called a human factor.⁸⁵⁰ The method and the expert undertaking the method are closely linked, and one cannot be separated from the other.⁸⁵¹ This 'human factor' may have a perilous impact on forensic results.⁸⁵² As seen earlier, in a fingerprint examination human eye is a major instrument of analysis, making it vulnerable to human errors.⁸⁵³ It is largely based on human

⁸⁴⁷ Sandy L Zabell, *Fingerprint Evidence*, 13 J.L. & Pol'y 143,179 (2005).

⁸⁴⁸ C Champod and J Vuille, *Scientific Evidence in Europe--Admissibility, Evaluation and Equality of Arms*, 9(1) International Commentary on Evidence (2011).

⁸⁴⁹ A Campbell, *The Fingerprint Inquiry Report*, 43 Edinburgh, Scotland: Aps Group Scotland 790,50 (2011).

⁸⁵⁰ Taylor, K Melissa, David H Kaye and others, *Latent Print Examination and Human Factors: Improving the Practice Through a Systems Approach*, (NIST, 17 February 2012), <https://www.nist.gov/publications/latent-print-examination-and-human-factors-improving-practice-through-systems-approach> (last visited Sept. 29, 2021).

⁸⁵¹ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 136 (National Academies Press, 2009) 143

⁸⁵² Gary Edmond, *Latent Science: A History of Challenges to Fingerprint Evidence in Australia*, 38 U. Queensland LJ 301,317 (2019).

⁸⁵³ *Forensic Evidence Largely Not Supported by Sound Science – Now What*, (THE CONVERSATION, 7 December 2016), <https://theconversation.com/forensic-evidence-largely-not-supported-by-sound-science-now-what-67413> (last visited Jun. 10, 2021).

interpretation.⁸⁵⁴ In a study by *Dror*, it was found that the examination is so subjective that examiners differ from their previously recorded findings when asked to examine again in a different context.⁸⁵⁵ Each examiner makes an assessment of the prints based on his perception of the quality and quantity of the features. Consequently, the outcome of verification by different examiners varies.⁸⁵⁶ An examiner, based on his intuition, decides how much do the prints match. This remains problematic as there is no justification for a judgment he makes.⁸⁵⁷

Proficiency tests provide us with insight into error rates associated with fingerprint analysis.⁸⁵⁸ Collaborative Testing Service administered a proficiency exam that was developed by the International Association for Identification (IAI) in 1995.⁸⁵⁹ In the study, 156 examiners were provided with seven latent-prints and print of all ten fingers of four suspects. Shockingly, only 68 examiners could correctly identify all seven latent prints. And a total of 48 errors in identification were found. The reaction of the forensic community to this result ranged from shock to disbelief.⁸⁶⁰

Errors from cognitive bias and mistakes, which may be present in any situation, are not well handled or communicated. Biased sample selection and weighting may be caused by contextual bias, which happens when the forensic scientist utilises other evidence to assume that the specific evidence being assessed is connected to a certain reference sample.⁸⁶¹ Confirmation bias may be induced by contextual information. Even those who are operating in good faith and seeking to analyse the data objectively may be influenced by it. Other evidence, such as background of the accused and the prosecutor's

⁸⁵⁴ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 136 (National Academies Press, 2009) 139

⁸⁵⁵ IE Dror and D Charlton, *Why Experts Make Errors*, 56(4) J of Forensic Identification 600 (2006).

⁸⁵⁶ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 136 (National Academies Press, 2009) 139

⁸⁵⁷ Sandy L Zabell, *Fingerprint Evidence*, 13 J.L. & Pol'y 143,156 (2005).

⁸⁵⁸ *Id.* at 167.

⁸⁵⁹ David Grieve, *Possession of Truth*, 46 J. Forensic Identification 521,523 (1996).

⁸⁶⁰ *Id.* at 525.

⁸⁶¹ Taylor, K Melissa, David H Kaye and others, *Latent Print Examination and Human Factors: Improving the Practice Through a Systems Approach*, (NIST, 17 February 2012), <https://www.nist.gov/publications/latent-print-examination-and-human-factors-improving-practice-through-systems-approach> (last visited Sept. 29, 2021).

theory of the case, are not needed for examination and do not get documented in the reports. Such information has been referred to as ‘domain-irrelevant information’ by Gary Edmond.⁸⁶² Having knowledge of the prior assessment influences the verifier’s examinations irrespective of how hard the verifier tries to be objective.⁸⁶³ An examiner shall not be exposed to case-related information that is irrelevant, and that may influence the examiner’s ability to reach an objective conclusion.⁸⁶⁴ The perception that a fingerprint examiners report can be significantly swayed by extraneous information has gained ground and has been conceded to be a real phenomenon. Contextual influences have been shown to have a corrosive influence on the expert’s reports by several prominent studies. *Dror*, in the first of its kind study, analysed the effect of extraneous information on the functioning of forensic science.⁸⁶⁵ The experiment undertaken in the study showed that fingerprint identification conclusions by expert are vulnerable to irrelevant and misleading context.⁸⁶⁶ The research involves obtaining fingerprints that had previously been studied and matched by latent print specialists. The very same prints were given to the same specialists, but with a context that hinted they were a no-match, and as a result, the culprits were unable to be identified and arrested. With this backdrop, the majority of fingerprint specialists reached alternative conclusions, which were in direct conflict with their own earlier identification determinations. How the questions are posed before the expert and how the data is provided to him can cause biasness in his findings.

4.2.1 REVIEW OF LOWER COURT JUDGMENTS ON FINGERPRINT EVIDENCE

The purpose of the case review is to evaluate the efficiency of legal safeguards/mechanisms that are intended to protect the credibility/integrity of Indian judicial system. This section consists of a review of judicial decisions of the lower courts to provide an account of how the legal community is making use of fingerprint identification technique as evidence in the courts. As shown in table 4.2, 119 cases

⁸⁶² Edmond, G., Tangen, J.M., Searston, R.A. and others, *Contextual Bias and Cross-contamination in the Forensic Sciences: The Corrosive Implications for Investigations, Plea Bargains, Trials and Appeals*, 14(1) LAW, PROBABILITY AND RISK 1 (2015).

⁸⁶³ *Id.* at 13.

⁸⁶⁴ Gary Edmond, *The Science of Miscarriages of Justice*, 37 U.N.S.W.L.J. 376 (2014).

⁸⁶⁵ Itiel E Dror, David Charlton and Ailsa E Peron, *Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications*, 156 Forensic Science Intl. 74 (2006).

⁸⁶⁶ *Id.* at 3.

relating to fingerprint evidence was analysed. The preliminary analysis of these judgments revealed that in 53 judgments there was no discussion relating to fingerprint evidence. For instance, in some judgments there is mention of fingerprint expert taking chance prints but there was no further mention of the fingerprint report.⁸⁶⁷ Some judgments mentioned that fingerprint expert reached the crime spot and there is no further information.⁸⁶⁸ In 28 other judgments the prints were not clear, unfit for comparison, could not be found, or the report was not presented to the court. Thus, after removing these 53 and 28 judgments 38 judgments remained that were finally analysed.

Table 4.3

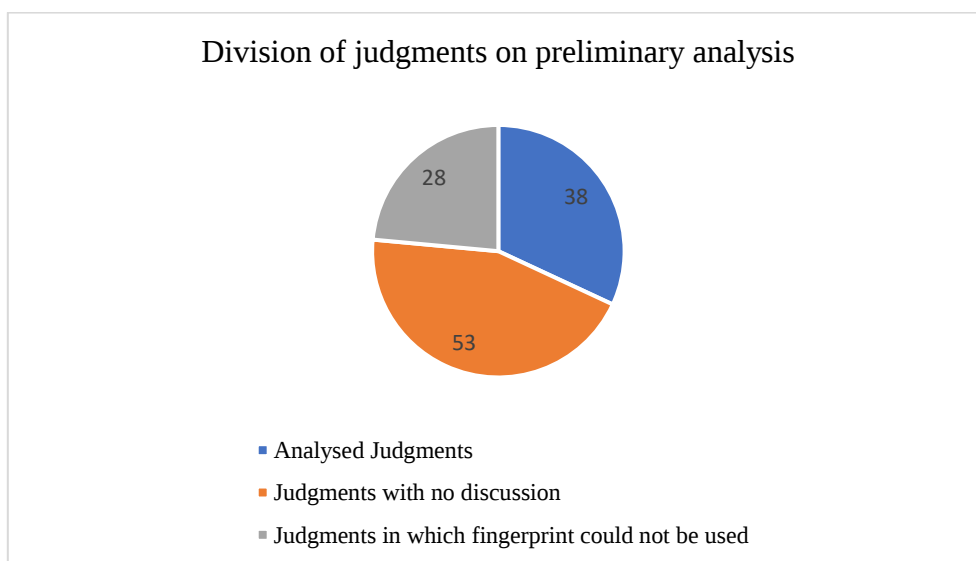


Figure 4-0-4

The relevant excerpts from these judicial decisions have been categorised based on the terminology used, nature of the objection raised against the fingerprint evidence and observations made regarding the exactness of the fingerprint identification. It should be noted that the evaluation of fingerprint evidence is the main focus of the judgement reviewed in this section. It's possible that the judge's decision was influenced by additional evidence. Furthermore, it is impossible to determine from the ruling how much the judge relied on a piece of evidence. Therefore, it would be incorrect to claim

⁸⁶⁷ *State v. Veer Bahadur*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/54469620/> (last visited Nov. 25, 2022), para 16.

⁸⁶⁸ *State v. Utsav Bhasin*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/20432319/> (last visited Nov. 25, 2022), para 51.

that fingerprint evidence specifically influenced a case's outcome. However, it is feasible to gain insight into the evaluation of fingerprint evidence from the discussion on the evidence in a decision. The analysis of fingerprint evidence evaluated in this manner has also been carried out in other studies as well.⁸⁶⁹

4.2.1.1 Identification of fingerprints as *Identical*

The study revealed that in certain cases fingerprint report and testimony of fingerprint expert made use of the term 'identical.' The term 'identical' implies a high degree of certainty and certitude Use of such expression is not scientifically supportable in relation to fingerprint comparison.⁸⁷⁰ Yet, the result of fingerprint comparison was often presented as *identical*. The following are the relevant excerpts from such judgments –

- chance print mark Q4 was found identical with the right ring finger impression of Sagar (testimony of SI).⁸⁷¹
- “PW18 testified that he had examined the chance prints mark Q1 and Q2 and found chance print mark Q1 was identical with right thumb impressions mark S1 on finger prints slips of Shahabuddin son of Bundu Khan.”⁸⁷²
- “Chance prints mark Q2 and Q7 were found identical with specimen right ring and right middle finger impression respectively of accused Amit Rathi. (fingerprint expert from the finger print bureau).⁸⁷³
- “After comparison, he found that chance print marked Q1 was identical with the specimen left palm portion slip of accused Sameer.”⁸⁷⁴

The excerpts mentioned above show that the term 'identical' is being used in relation to fingerprint comparison. Likewise, in the case of *State v. Monu*, fingerprint expert

⁸⁶⁹ Edmond, Gary, Emma Cunliffe, and David Hamer, *Fingerprint comparison and adversarialism: The scientific and historical evidence*, 83(6) The Modern L. Rev. 1287 (2020).

⁸⁷⁰ Anne Q Hoy, *Fingerprint Source Identity Lacks Scientific Basis for Legal Certainty*, (AAAS, 14 September 2017), <https://www.aaas.org/news/fingerprint-source-identity-lacks-scientific-basis-legal-certainty> (last visited May 15, 2022).

⁸⁷¹ *State v. Yadvendra Kadyan*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/51244846/> (last visited Sept. 29, 2021), para 161.

⁸⁷² *State v. Mohd. Irfan etc.*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/189125556/> (last visited Sept. 29, 2021), para 28.

⁸⁷³ *State v. Amit Rathi*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/118685271/> (last visited Sept. 29, 2021), para 185.

⁸⁷⁴ *State v. Imran*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/62185511/> (last visited Sept. 29, 2021), para 92.

reported that he analysed the chance print and discovered that chance print Q1 & Q2 & Q5 & Q6 are identical with the right ring and right middle finger of the accused Monu's specimen impressions.⁸⁷⁵ In *State v. Anil Puri*, the mobile crime team found that the chance prints were identical to the impression of the finger palm of the co-accused.⁸⁷⁶ In *State v. Sanjay and Lalit*, the report of the experts from the Finger Print Bureau states that the chance prints were identical to the right index and the left index finger of the accused. Similarly, in the case of *State v. Mehboob Hasan*⁸⁷⁷, *State v. State of Rajasthan*⁸⁷⁸ and *State v. Sanjeev Kumar Singh*⁸⁷⁹ the forensic reports presented to the court gave findings using the term identical to convey the result of comparison between chance prints and the admitted prints.

Moreover, three judgments were also found where the report explicitly stated that the prints belonged to a specific person and were only his prints. They are:

- "It has been opined that the questioned thumb impression on the disputed Will had been found to be that of complainant himself"⁸⁸⁰
- "Thumb impression on the documents in question were that of Virender."⁸⁸¹
- "Analyzed the fingerprints of accused Md. Hussain @ Lalu, with the record available with them and found that the same were of accused Md. Hussain @ Lalu. He proved the report in this regard as Ex.PW11/B."⁸⁸²

⁸⁷⁵ *State v. Monu*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/78259493/> (last visited Sept. 29, 2021), para 22.

⁸⁷⁶ *State v. Anil Puri*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/79316276/> (last visited Sept. 29, 2021), para 32.

⁸⁷⁷ *State v. Mehboob Hasan*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/24744904/> (last visited Sept. 29, 2021), para 13.

⁸⁷⁸ *State v. State of Rajasthan*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/32518948/> (last visited Sept. 29, 2021), para 35.

⁸⁷⁹ *State v. Sanjeev Kumar Singh*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/122066277/> (last visited Sept. 29, 2021), para 63.

⁸⁸⁰ *Rakesh Sehgal v. State*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/198983537/> (last visited Sept. 29, 2021), para 21.

⁸⁸¹ *State v. Kamal Malik*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/145314636/> (last visited Sept. 29, 2021), para 25.

⁸⁸² *State v. Mohd. Jamil*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/21284003/> (last visited Sept. 29, 2021), para 15.

In the excerpts cited above, there is a categorical and unconditional claim of having identified the exact fingerprint. These claims indicate a high degree of certainty about the match and leave no scope for doubt or uncertainty. Such claims, as explained above, are not scientific and are based on conjectures.⁸⁸³ It is specifically outlined that the use of fingerprint analyses to claim to have identified a specific person is unfounded. “The claim that examiners can narrow the potential donors of a particular latent print to a single individual and thus infallibly identify the source of a print has also been rejected as indefensible.”⁸⁸⁴ Reports that Claim to have determined the source of a fingerprint overlook the uncertainty surrounding the uniqueness of fingerprints.⁸⁸⁵ The assertion that a certain fingerprint pattern is unique, belongs to a particular individual, and unlikely to be replicated lacks any supporting empirical evidence.⁸⁸⁶

No reference is being made to the limitations of the fingerprint examination in any of the judgments referred to above. It is dangerous to disregard or fail to acknowledge the high rate of false positives in fingerprint examination.

Few judgments were identified in which the language used is more epistemologically modest, i.e., in place of describing the result of comparison in conclusive terms, a more modest language such as a ‘match’ or ‘tally’ was used. They are:

- “From the car also finger prints were lifted which tallied with the finger print of Sagar.”⁸⁸⁷
- “The chance fingerprints lifted from the looted truck were compared with the specimen prints of the accused persons and as per report of the FSL, the same matched with that of Laxman @ Sonu.”⁸⁸⁸

⁸⁸³ Anne Q Hoy, *Fingerprint Source Identity Lacks Scientific Basis for Legal Certainty*, (AAAS, 14 September 2017), <https://www.aaas.org/news/fingerprint-source-identity-lacks-scientific-basis-legal-certainty> (last visited May 15, 2022).

⁸⁸⁴ AAAS, *Forensic Science Assessments: A Quality and Gap Analysis- Latent Fingerprint Examination*, September 2017, p 60 (Report prepared by William Thompson, John Black, Anil Jain, and Joseph Kadane).

⁸⁸⁵ *Id.* at 62.

⁸⁸⁶ *Ibid.*

⁸⁸⁷ *State v. Yadvender Kadyan*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/51244846/> (last visited Sept. 29, 2021), para 4.

⁸⁸⁸ *State v. Mohd. Nazir*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/77528161/> (last visited Sept. 29, 2021), para 16.

In the abovementioned judgments, the terms used in relation to the comparison of fingerprints are ‘tallied’ and ‘matched’. These are indicative of a lesser degree of certainty. In a similar manner, in *Parvesh v. State*, the forensic report concluded that the fingerprints of the accused *match* with the chance prints found on the car.⁸⁸⁹ These claims are technically tenable in contrast to the categorical assertion that the fingerprint has been identified. The language employed to present the findings is somewhat more subdued. It is more suitable to use words like “tally” or “match,” but doing so without mentioning any caveats could also lead to misinformation. This is because the judge can choose how to interpret the phrases “tally” and “match.” The meaning of these expressions may be viewed by the court as being equivalent to that of the more widely used term “identical.” There is always the possibility of misinterpretation, especially when limitations, error rates, or chances of false positives are not mentioned. The following chart presents a pictorial view of the number cases and the terminology used.

Table 4.4

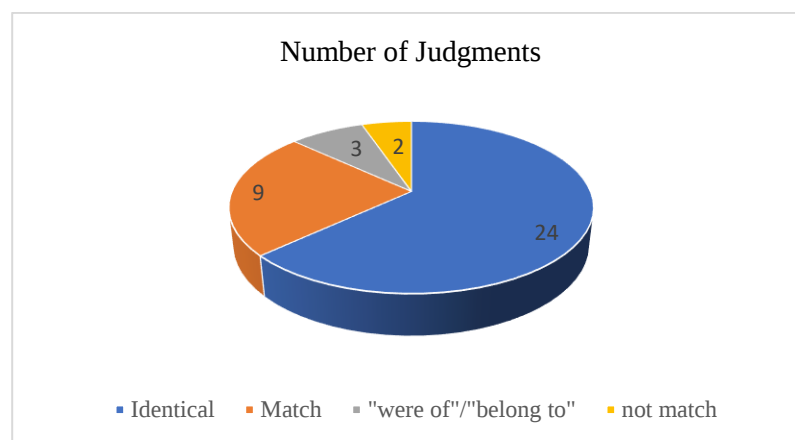


Figure 4-0-5

4.2.1.2. Fingerprint comparison as *Failsafe* and *Exact Science* and reliance on outdate legal precedents

It was astounding to learn that some experts and judges believed that fingerprint identification report could be a sole proof of a fact, despite the fact that scientific studies

⁸⁸⁹ *Parvesh v. State*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/75519628/> (last visited Sept. 29, 2021).

have shown that fingerprint identification results are not error-free.⁸⁹⁰ The following excerpt demonstrates that fingerprint identification is presented as a failsafe method of establishing an accused's identity.

“Ld. APP submitted that this circumstance of finding the finger prints point towards the guilt of the accused.”⁸⁹¹

Further, in *State v. Imran*⁸⁹² the court held that, in the absence of any explanation regarding the presence of fingerprints of the accused at the scene of the crime, it is safe to conclude on the basis of the fingerprint report that the accused was present at the scene of the crime. The court in the case referred to three higher court judgments to provide credence to their conclusion. They are *Bhagwan Mahalik v State (NCT of Delhi)*⁸⁹³ decided by the Hon'ble High Court of Delhi, *Munna Kumar Upadhyaya aka Munna Upadhyaya v State of Andhra Pradesh*⁸⁹⁴ and *B.A. Umesh v Registrar General, High Court of Karnataka*.⁸⁹⁵ The cited judgments have held that fingerprint comparison evidence is reliable and vital incriminating evidence. Some of the judgments illustrated a firm faith in the identification capability of the fingerprint technique. For instance –

“The law is well settled that evidence given by finger print expert need not necessarily be corroborated but the court must satisfy itself as to the value of the evidence of the expert in the same way as it must satisfy itself of the value of other evidence.”⁸⁹⁶

⁸⁹⁰ Cole S.A, *More Than Zero: Accounting for Error in Latent Fingerprint Identification*, 95(3) *Journal of Criminal Law & Criminology* 985,1042 (2005).

⁸⁹¹ *State v. Amit Rathi*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/118685271/> (last visited Sept. 29, 2021), para 202.

⁸⁹² *State v. Imran*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/62185511/> (last visited Sept. 29, 2021).

⁸⁹³ CrI. A. No. 326 of 2011 dated 29.11.2012.

⁸⁹⁴ AIR 2012 SC 2470.

⁸⁹⁵ AIR 2011 SC 1000.

⁸⁹⁶ *State v. Sabir Malik*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/180389461/> (last visited Sept. 29, 2021), para 23.

Disappointingly, the reliability of a forensic technique in *State v. Imran*⁸⁹⁷ was established using outdated legal precedents and completely ignoring the recent scientific literature. A vicious circle of misinformation seems to have been formed. This is a proof of findings in Section 6.5 of Chapter 6 that reliance on legal precedents in matters of science is a general practice though it could be a dangerous and misleading. If the actual reliability of fingerprint examination had been realised, it's possible that the verdict in these cases would have been different.

It was a respite to have found that there were judgments wherein the court raised suspicion over relying solely on fingerprint evidence. In *State v. Anil Puri*⁸⁹⁸ the court held that solely because the prints on the water bottle discovered in the vehicle of accused Anil Puri matched with the fingerprints of accused Shahid Ali, it is not enough to establish his involvement in the murder of *Rajesh Saini*.⁸⁹⁹ In another judgment, the court held that a verdict of guilt cannot be rendered in the current instance only on the basis of the fingerprint report and that the accused is entitled to the benefit of the doubt in the absence of other evidence implicating him.⁹⁰⁰ This also shows clear contradiction in judicial understanding of reliability of forensic technique and hence, the possible of legal uncertainty. The objective is not to suggest that all judgments were incorrect; rather, the aim is to state that certain judgements were made based on an incorrect presupposition. This finding should not be overlooked because it may cause injustice to innocent individuals. Regrettably, a judge may continue making mistakes for the rest of his life without recognizing how or where they are being made.

4.2.1.3 Reliance on Cross-examination

Certain instances show court's propensity to rely on cross-examination to safeguard against excessive or untruthful expert testimony. For instance –

⁸⁹⁷ *State v. Imran*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/62185511/> (last visited Sept. 29, 2021).

⁸⁹⁸ *State v. Anil Puri*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/79316276/> (last visited Sept. 29, 2021).

⁸⁹⁹ *State v. Anil Puri*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/79316276/> (last visited Sept. 29, 2021).

⁹⁰⁰ *State v. Devender Kumar*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/4952992/> (last visited Sept. 29, 2021).

“His cross examination did not bring out anything which could make this witness untrustworthy.”⁹⁰¹

Also, in *State v. Sabir Malik*, the court held that the testimony of the expert was completely trustworthy as the reliability and expertise of the examiner were not called into question in the cross-examination.⁹⁰² The court in *State v. Dalip*,⁹⁰³ on similar lines, held that the accused failed to raise any doubts about the technique utilised or its authenticity in the cross-examination and, accordingly, the reliability of the fingerprint report cannot be questioned.

It is important to make a reference to chapter 6 section 6.4. According to the study involving judge’s interviews, it was found that cross-examination is used as a tool to gauge the credibility of forensic expert testimony. The judgements mentioned above support this finding. The rulings unequivocally demonstrate that cross-examination is utilised in courts as a legal instrument for determining the credibility of expert testimony. The court explicitly stated in the case *State v. Dalip* that the reliability and authenticity of a forensic approach were questioned over the course of the cross-examination. It was believed that the issue had been resolved by way of cross-examination and nothing more was required to be done. In this way, judges’ responsibility as gatekeepers of expert evidence was delegated to the counsel of the parties. Cross-examination cannot be relied on to expose the limitations of expert testimony.⁹⁰⁴ Moreover, it is a dereliction of gatekeeping duty of a judge as law demands that expert testimony shall be evaluated by the judge specifically.⁹⁰⁵

4.2.1.4 Nature of objections raised

The nature and potency of these objectives have the potential to correct the misconception regarding the probative value of fingerprint analysis. It is, therefore,

⁹⁰¹ *State v. Sonu*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/149275000/> (last visited March 26, 2024) para 8.

⁹⁰² *State v. Sabir Malik*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/180389461/> (last visited March 26, 2024) para 26.

⁹⁰³ *State v. Dalip*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/165812106/> (last visited Sept. 29, 2021) para 23.

⁹⁰⁴ Buckland, Prudence, *Honeysett v The Queen* (2014) 311 ALR 320: *Opinion evidence and reliability, a sticking point*, 35(2) ADELAIDE LAW REVIEW 449,459 (2014).

⁹⁰⁵ *Ranjitsing Brahmajeetsing Sharma v. State of Maharastra*, AIR 2005 SC 2277; *Nnadi K. Iheanyi v. Narcotics Control Bu2reau*, CRL. A. 1416 of 2010, Delhi HC.

critical to determine whether an effective and meaningful challenge is being raised in a situation when the fingerprint examination report is presented as highly certain and perceived as accurate. The following cases showcase the nature of objections were raised against fingerprint evidence.

- “The same was in an unsealed condition and therefore in view of the above the tampering of the same cannot be ruled out. The prosecution failed to explain as to why the exhibits were sent in unsealed condition specially when the offence pertains to forgery.”⁹⁰⁶
- “The manner of lifting chance prints is doubtful.”⁹⁰⁷
- “The chance prints were not sealed properly.” (Defence objection)⁹⁰⁸

In the same way, the court, in the case of *State v. Sanjay and Lalit*, expressed doubt about the veracity of fingerprint evidence holding that location of the chance prints cannot be identified.⁹⁰⁹ In *State v. State of Rajasthan*, the court showed concern about how, when, or by whom the accused’s fingerprints had been collected, delivered to the Finger Prints Bureau for comparison, or otherwise brought to the laboratory.⁹¹⁰ In *State v. Yadvender Kadyan*, when a suspect’s fingerprints were obtained, they were not taken with the approval or in front of a magistrate, which raises doubts about the genuineness of the process.⁹¹¹ In *State v. Mohd. Irfan*, the court held that the fingerprints were obtained without the court’s approval, hence they cannot be relied upon.⁹¹² In *State v. Mukesh Kumar*⁹¹³, the court held the fingerprint evidence to be unreliable and

⁹⁰⁶ *State v. Yogesh*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/24810999/> (last visited Sept. 29, 2021), para 13.

⁹⁰⁷ *State v. Parvesh Tyagi*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/10772774/> (last visited Sept. 29, 2021), para 54.

⁹⁰⁸ *State v. Sabir Malik*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/180389461/> (last visited Sept. 29, 2021), para 19.

⁹⁰⁹ *State v. Sanjay and Lalit*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/188785898/> (last visited Sept. 29, 2021).

⁹¹⁰ *State v. State of Rajasthan*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/32518948/> (last visited Sept. 29, 2021).

⁹¹¹ *State v. Yadvender Kadyan*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/51244846/> (last visited Sept. 29, 2021).

⁹¹² *State v. Mohd. Irfan*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/189125556/> (last visited Sept. 29, 2021).

⁹¹³ *State v. Mukesh Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/86952220/> (last visited Sept. 29, 2021).

unacceptable for the reason that prints were not lifted in a proper way, the seizure memo of the cup from which the prints were lifted was absent, and the location and the time at which the prints were lifted were not on record.

The excerpts cited above illustrate that objections raised against fingerprint evidence relate to procedural aspects, such as lifting of the prints, sealing of the samples, doubt relating to location of prints, approval of a magistrate, etc. The nature of these procedural in that sense that they do not relate to intrinsic worth of the evidence. They expert report was outrightly rejected on grounds of procedural lacunae. Thus, in these cases the evidence could not reach the stage of weighing the evidence.

The following are the instances in which an epistemic objection was raised.

- “PW36 had not followed the practice and standard to be followed vis avis conclusion drawn with regard to bifurcation, ridge ending, short rides are contrary to his analysis, that report not reliable.”⁹¹⁴
- “In this report, the result of the examination has been mentioned. However, there is no explanation as to on what basis and what manner the Finger Print Analyst/expert has reached this conclusion.”⁹¹⁵

In another case, i.e., *Dr. Satish Kumar v. Sh. Shiv Kumar*⁹¹⁶, the court found technical discrepancies in the report of the fingerprint expert. The expert had noted the slant of ridges on the disputed thumb impressions. Yet, no such tilt was discernible in Exhibits D1, D2, and D7, since the fingerprints in those places are completely blurred. The court noted that, according to the expert, the contested thumb print had a “elliptical” pattern, whilst the accepted impression had a “double loop pattern” indicating that the two impressions cannot be from the same individual. Such a similar technical error was found in the report of a fingerprint expert in the case of *State v. Mehboob Hasan*.⁹¹⁷ The

⁹¹⁴ *State v. Mohd. Sabbir*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/122777044/> (last visited Sept. 29, 2021), para 7.1.2.

⁹¹⁵ *Rakesh Sehgal v. State*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/198983537/> (last visited Sept. 29, 2021), para 21.

⁹¹⁶ *Dr. Satish Kumar v. Sh. Shiv Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/45824139/> (last visited Sept. 29, 2021).

⁹¹⁷ *State v. Mehboob Hasan*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/24744904/> (last visited Sept. 29, 2021).

court, in this case, observed that there was a display of a totally different pattern on the superimposition of chance prints and the admitted prints. The court rejected that fingerprint comparison report, holding that on superimposition one can readily conclude the prints belong to two different people.

The court's consideration epistemic basis of the forensic report is reassuring, yet these objections did not touch upon the foundational worthiness of fingerprint examination. The judges in these cases have given consideration to elements like rationale, the method used for fingerprint comparison, the pattern and structure of the fingerprint, etc. Before putting any trust in the fingerprint expert's assessment, it is crucial to take these factors into account. However, the lack of any discussion of scientific literature leads one to believe that the debate of fingerprint reports in courts is only concerned with the specifics of how the test was conducted in a given instance. Additionally, it was not considered necessary to discuss the intrinsic worth or reliability of fingerprint analysis as a technique in court. For instance, in the case of *State v. Mohd. Sabir*,⁹¹⁸ the report of the expert states that the chance prints were 'identical' to the specimen prints. This extent of certainty was not disputed by either the defence or the judge. The defence only questioned the procedure followed by the expert. This was their only objection that the court rejected on ground of insufficient cross examination. The court did not find any epistemological fault in the report. This could be owing to the legal precedents that have categorically stated that reliability has been established, ending any discussion of the matter. In none of the judgments did the court consider any scientific published studies or papers, which may be the result of a firm assumption that the scientific status of fingerprint evidence is static and the technique has been given the status of judicially acknowledged forensic technology. The court, judges, and counsel are not concerned with issues like, error rates, or changes in the status of fingerprint analysis.

4.2.2 INFERENCE REGARDING THE APPRECIATION OF FINGERPRINT EVIDENCE IN LOWER COURTS

As stated in section 4.2.1, a total of 38 judgements involving the use of fingerprint evidence were reviewed. The analysis was split into four sections, 4.2.1.1 to 4.2.1.4, based

⁹¹⁸ *State v. Mohd. Sabir*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/122777044/> (last visited Sept. 29, 2021), para 7.5.

on the discussion included in these judgments. There is a discussion on a certain issue in each section. Following are the inferences drawn from each of these four sections:

1. The review of judgments demonstrates that experts express the conclusions and results of fingerprint examination unreservedly. In 24 out of 38 analysed judgments the term ‘identical’ was used to present the findings of the examination. And, in 9 judgments the result was stated with the help of the “match.” The use of various phrases does not always imply that the judge has considered the outcome as certain and extremely accurate. Regardless of the wording employed in the report, the court may correctly comprehend the probative usefulness of the report. However, these findings are proof of the fact that evidence is presented in courts in a manner that is scientifically indefensible. As was shown in sections 4.2.1.2, some judges view fingerprint evidence as being based on exact science. These judges are likely to mistakenly view the fingerprint expert’s report as the most conclusive evidence of the person’s identity. In other words, there is a possibility that a court could be misled by simply relying on the expert report unless the judges are fully cognizant of the reliability of a forensic technique. This shows how necessary vigilant gatekeeping on the part of a judge is to prevent injustice to the litigants.

2. In a few decisions, judges have shown such strong confidence in the results of the fingerprint examination that they did not consider the rule requiring the corroboration of expert evidence should be applied in cases where fingerprint evidence is present. This is a misguided notion that is unsupported by the scientific research and literature mentioned above. There may be few instances where fingerprint identification evidence was regarded as highly reliable. However, this does not render this finding unimportant. Even one incident of correctly weighing forensic evidence or one instance of a wrongful conviction must be looked into, and the underlying reason of the error must be researched. Additionally, the results of the judge interviews reported in chapter 5 section 5.4 support this conclusion. That section showed that 9 out of 20 participants thought that fingerprint evidence was highly reliable and that there was no need to seek corroboration before relying on the results of the fingerprint examination.

The courts, attorneys, and experts should be fully aware that, in relation to fingerprint identification, human mistake is a possibility and subjectivity cannot be avoided.⁹¹⁹ Fingerprint reports that indicate a high degree of certitude should trigger warning bells. It is utterly important to recognise the limitations of fingerprint evidence due to its subjective character and to acknowledge that it is not flawless.⁹²⁰ The methodology, i.e., ACE-V, does not protect against subjectivity and bias. There is no surety of getting the same results when the examination is done by two different experts. Therefore, adherence to ACE-V does not guarantee that one is doing research in an appropriate way or obtaining accurate findings.⁹²¹ The research demonstrates that, despite scientific cautions that such an approach is ‘indefensible,’ fingerprint evidence is being consistently understood as unqualified confirmation of identification. The case of *State v. Imran*⁹²² shows that the courtroom actors have shown a disregard for scientific warnings, opting instead to follow conventional beliefs in the name of legal precedents. Judge’s Achilles heel is their reluctance to go into areas beyond their own expertise. The unconditional trust of judges in expert evidence mirrors the broader unwillingness of certain forensic scientists to admit their method’s frailties and limits.⁹²³

3. In a few instances, cross-examination was used as a tool to determine the credibility of expert evidence. Section 6.4 of Chapter 6 addressed the inadequacies of cross-examination as a technique to assess the reliability of forensic evidence. It is important to stress once more that the effectiveness of cross-examination depends on the competence of the other party’s counsel. In contrast, the court has a duty to personally evaluate and weigh the expert testimony. Thus, the findings of section 6.4. of chapter 6

⁹¹⁹ *Forensic Evidence Largely Not Supported by Sound Science – Now What*, (The Conversation. 7 December 2016), <https://theconversation.com/forensic-evidence-largely-not-supported-by-sound-science-now-what/67413> (last visited Jun. 10, 2021).

⁹²⁰ A Campbell, *The Fingerprint Inquiry Report*, 43 Edinburgh, Scotland: Aps Group Scotland 790,684 (2011).

⁹²¹ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 136 (National Academies Press, 2009) 142

⁹²² *State v. Imran*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/62185511/> (last visited Sept. 29, 2021).

⁹²³ Edmond, G., Tangen, J.M., Searston, R.A. and others, *Contextual Bias and Cross-Contamination in the Forensic Sciences: The Corrosive Implications for Investigations, Plea Bargains, Trials and Appeals*, 14(1) Law, Probability and Risk 125 (2015).

have been reaffirmed that adversarial mechanisms are being utilised to evaluated expert evidence.

The majority of the challenges to the fingerprint evidence related to the investigative shortcomings. The study found just a few instances where the technical grounds of the inference to identification were addressed. None of the judgments presented substantial/peripheral engagement with the scientific validity, reliability, and actual probative worth of fingerprint identification. Discussion on issues, such as rate of error, empirical basis of the expressions used in the report, proficiency of the methodology involved, tools used to manage subjective bias etc., was entirely missing from the discussion present these judgments. It is hard to comprehend how an accurate evaluative decision can be arrived at without consideration of these epistemological matters. This is indicative of institutional neglect of epistemological dimension of the fingerprint evidence.

4.3 VOICE IDENTIFICATION EVIDENCE

It would be prudent to begin with a brief discussion on the fundamentals of voice identification technique. An overview of certain significant facts and issues relating to this technique would provide guidance and direction for review of judgments.

Primarily, identification made on the basis of a person's voice is called voice identification.⁹²⁴ It is also referred to as "ear witness identification."⁹²⁵ This forensic technique has proven useful for identification in several difficult situations. A famous instance of the use of this technique is the arrest of a drug kingpin, namely Juan Carlos Ramirez Abadia, on the basis of his voice.⁹²⁶ He had undergone plastic surgery to change his physical appearance.⁹²⁷ The United States Drug Enforcement Agency in the year 2007 with the help of voice recordings identified him.⁹²⁸ Likewise, there are numerous other situations in which identification based on the voice can be crucial evidence.⁹²⁹

⁹²⁴ AD Yarmey, *Earwitness speaker identification*, 1 Psych'y, Public Pol'y, L 792,795 (1995).

⁹²⁵ Stephen A. Saltzburg, *Voice Identification Experts*, 27 CRIM. JUST. 48,48 (2013).

⁹²⁶ Charanjit Singh, *Quis Custodiet Ipsos Custodes: Should Justice Beware: A Review of Voice Identification Evidence in Light of Advances in Biometric Voice Identification Technology*, 11 INT'L COMMENT ON EVIDENCE 1,21-22 (2013).

⁹²⁷ *Ibid.*

⁹²⁸ *Ibid.*

⁹²⁹ Jeremy Robson, *Lend Me Your Ears: An Analysis of How Voice Identification Evidence Is Treated in Four Neighbouring Criminal Justice Systems*, 22 INT'L J. EVIDENCE & PROOF 218,220 (2018).

For instance, the perpetrator of a crime may be wearing a mask to cover his appearance, or when the victim is being blindfolded and is not able to see the face of the criminal, or when a telephone recording of the conversation with the criminal is available.⁹³⁰

Everyone has a distinct voice.⁹³¹ Voices of different people differ from each other significantly, and therefore, they can be used as a tool for identification of the speaker.⁹³² Voice identification may be done by experts or by lay witnesses. Lay witnesses have a varying degree of capacity to remember voices. Some people are good at identifying voices, and some are not.⁹³³ Longer and repeated exposure of voices results in better identification.⁹³⁴ Voices heard live/in person are more likely to be remembered accurately than voices heard over the telephone.⁹³⁵ Foreign languages or foreign accents are less likely to be remembered.⁹³⁶ Voice identification experts are considered to be better at comparing voices than lay witnesses.⁹³⁷

Identification by experts is possible in cases where a recording of the voice to be identified is available. There are two methods of comparing disputed recordings with a voice of a suspect, one is auditory analysis and the other is acoustic analysis.⁹³⁸ Auditory analysis involves listening to the two samples (disputed voice sample and the known voice sample) and arriving at a conclusion as to whether the two samples match or not based on similarities/dissimilarities.⁹³⁹ On the other hand, acoustic analysis entails the study of graphical representations of the voices.⁹⁴⁰ The graphical representation is known as spectrograph and is produced electronically.⁹⁴¹ In other words, spectrographic analysis involves producing visual graphical voiceprints or spectrogram.⁹⁴² The

⁹³⁰ *Ibid.*

⁹³¹ Lirieka Meintjes-van der Walt, *Voice Identification and Ear-Witnessing in the Dock*, 31 S. AFR. J. CRIM. JUST. 391,391 (2018).

⁹³² *Ibid.*

⁹³³ Lawrence Solan, Peter Tiersma, *Hearing Voices: Speaker Identification in Court*, 54 HASTINGS L. J. 373,376 (2003).

⁹³⁴ *Ibid.*

⁹³⁵ *Ibid.*

⁹³⁶ *Ibid.*

⁹³⁷ *Id.* at 377.

⁹³⁸ Jeremy Robson, *Lend Me Your Ears: An Analysis of How Voice Identification Evidence Is Treated in Four Neighbouring Criminal Justice Systems*, 22 INT'L J. EVIDENCE & PROOF 218,221-22 (2018).

⁹³⁹ *Ibid.*

⁹⁴⁰ *Ibid.*

⁹⁴¹ *Ibid.*

⁹⁴² *Voice Identification Based on Spectrographic Analysis*, 2 U. BALT. L. REV. 114,114 (1972).

voiceprints show the frequencies, pitch and amplitude of sounds on a time line.⁹⁴³ Acoustic analysis of voice is based on the premise that everyone has a unique voice because of differences in the manner in which nasal, throat and oral cavities of each individual is coupled.⁹⁴⁴ And, there are differences in the manner in which the tongue and lips are moved by each individual.⁹⁴⁵

Regarding to forensic use of voice identification technique, certain arguments have been raised regarding reliability of such identification. These arguments are on the same lines as the arguments raised against reliability of fingerprint evidence, such as element of subjectivity inherent in the process, no proof of uniqueness, scope of error, etc. *Ormerod* argues that the assumption that an individual can be identified based on his voice is fallacious.⁹⁴⁶ There are factors, such as deliberate changes in the voice and the quality of voice recording, that may result in variation in voice.⁹⁴⁷ *Phillip* contends that voice identification is a subjective forensic technique.⁹⁴⁸ Further, it is contended the reliability of the result of an acoustic analysis is highly prone to error.⁹⁴⁹ Resultantly, there is a need to be cautious while appreciating evidence based on voice identification.⁹⁵⁰ Though, there have been no significant studies to assess the error rate of identification by voice.⁹⁵¹ Yet, the possibility of error in voice comparison is a significant fact. In fact, the National Academy of Science in 1979 questioned the very foundation of spectrographic analysis stating that forensic use of spectrographic analysis is not supported by sufficient evidence.⁹⁵² This resulted in some courts in the U.S. abandoning

⁹⁴³ Lawrence Solan, Peter Tiersma, *Hearing Voices: Speaker Identification in Court*, 54 *Hastings L. J.* 373,417 (2003).

⁹⁴⁴ *Voice Identification Based on Spectrographic Analysis*, 2 *U. BALT. L. REV.* 114,116(1972).

⁹⁴⁵ *Ibid.*

⁹⁴⁶ Ormerod D, *Sounding out expert voice identification, Expert evidence and scientific proof in criminal trials*, 10 *CRIMINALLAW REVIEW* 770-790 (2002).

⁹⁴⁷ *Ibid.*

⁹⁴⁸ Axelle C. Philippon, Julie Cherryman, Aldert Vrij & Ray Bull, *Why is My Voice so Easily Recognized in Identity Parades - Influence of First Impression on Voice Identification*, 15 *Psychiatry Psychol. & L.* 70 (2008).

⁹⁴⁹ Cindy E. Laub, Lindsey E. Wylie & Brian H. Bornstein, *Can the Courts Tell an Ear from an Eye: Legal Approaches to Voice Identification Evidence*, 37 *LAW & Psychol.* 119,157 (2013).

⁹⁵⁰ *Ibid.*

⁹⁵¹ Jeremy Robson, *Lend Me Your Ears: An Analysis of How Voice Identification Evidence Is Treated in Four Neighbouring Criminal Justice Systems*, 22 *INT'L J. EVIDENCE & PROOF* 218,222 (2018).

⁹⁵² COMMITTEE ON EVALUATION OF SOUND SPECTROGRAMS, ASSEMBLY OF BEHAVIORAL AND SOC. SCIENCES, NAT'L RESEARCH COUNCIL, ON THE THEORY AND PRACTICE OF VOICE IDENTIFICATION (1979).

the use of the technique, whereas courts in some jurisdictions continued to use voice identification evidence.⁹⁵³

Morrison holds that it is important that before making use of voice identification technique, the accuracy and reliability of the technique shall be tested.⁹⁵⁴ If the accuracy is not sufficiently tested, the required research and testing shall be carried out.⁹⁵⁵ Further when the findings of forensic analysis are presented to the court, the report shall categorically state the precision and strength of the results.⁹⁵⁶ The judge shall be sufficiently informed about the factors that may affect the strength of the voice identification evidence.⁹⁵⁷ This would enable the judge to come to a rightful decision regarding the probative worth of the forensic report.⁹⁵⁸ *Morrison* illustrates that in the case of voice identification, the report of the forensic expert may be presented in the following manner:

Based on my evaluation of the evidence, I have calculated that one would be X times more likely to obtain the acoustic properties of the voice samples if the questioned-voice sample had been produced by someone other than the accused than if it had been produced by the accused. Based on my calculations, I am 95% certain that it is at least X lower times more likely and not more than X upper times more likely.⁹⁵⁹

Ear witness identification has not been a subject of study by the legal fraternity.⁹⁶⁰ However, the dearth of foundational studies has not affected the forensic use of this technique. *Solan*, in relation to the court in the U.S., observes that scientific ignorance, rigid reliance on legal precedents, and judicial callousness have resulted in courts being

⁹⁵³ Lawrence Solan, Peter Tiersma, *Hearing Voices: Speaker Identification in Court*, 54 Hastings L. J. 373,377 (2003).

⁹⁵⁴ Morrison, Geoffrey Stewart, Cuiling Zhang, and Philip Rose, *An empirical estimate of the precision of likelihood ratios from a forensic-voice-comparison system*, 208(1-3) FORENSIC SCIENCE INTERNATIONAL 59,64 (2011).

⁹⁵⁵ *Ibid.*

⁹⁵⁶ *Ibid.*

⁹⁵⁷ Stephen A. Saltzburg, *Voice Identification Experts*, 27 CRIM. JUST. 48,50 (2013).

⁹⁵⁸ Morrison, Geoffrey Stewart, Cuiling Zhang, and Philip Rose, *An empirical estimate of the precision of likelihood ratios from a forensic-voice-comparison system*, 208(1-3) FORENSIC SCIENCE INTERNATIONAL 59,64 (2011).

⁹⁵⁹ *Ibid.*

⁹⁶⁰ Lawrence Solan, Peter Tiersma, *Hearing Voices: Speaker Identification in Court*, 54 Hastings L. J. 373,375 (2003).

unreceptive to literature and research the concerning reliability of voice identification evidence.⁹⁶¹

There are numerous instances of wrongful conviction because of wrongful voice identification. In fact the chances of wrongful identification are more in the case of an ear witness than in case of eye witness.⁹⁶² Guy Paul Morin was wrongfully identified and convicted on the charges of rape and murder by a court in Canada in the year 1995 based on voice identification.⁹⁶³ Three years later his innocence was proved with the help of DNA evidence and the conviction was reversed.⁹⁶⁴ Another such instance is the misidentification of William Hulet for the assassination of King Charles I.⁹⁶⁵ One of the witnesses misidentified William Hulet by his voice. His innocence was proved when the actual perpetrator of the crime was caught.⁹⁶⁶ These are some worrying facts and concerns relating to the use of voice recognition technology in courts. As regards the Indian superior court, the Supreme Court of India and High courts in India have reiterated certain rules of caution and legal precedents regarding the use of voice identification evidence.⁹⁶⁷ These rules so laid down have been consistent and relate to procedural safeguards. The precedents most frequently referred to are *Ziyouddin Burhanuddin Bukhari v. Brijmohan Ramdadd Mehra & Ors.*⁹⁶⁸ and *Ram Singh v. Col. Ram Singh.*⁹⁶⁹ These cases were decided by the Supreme Court in the year 1976 and 1985, respectively, and they still hold high precedential value. The court in the case held that the tape recordings of the speeches are admissible in evidence if the following conditions are satisfied:

1. The maker of the record duly identifies the voice on the record;
2. The voice on the tape shall be clear and not distorted;

⁹⁶¹ *Ibid.*

⁹⁶² Jeremy Robson, *Lend Me Your Ears: An Analysis of How Voice Identification Evidence Is Treated in Four Neighbouring Criminal Justice Systems*, 22 INT'L J. EVIDENCE & PROOF 218,219 (2018).

⁹⁶³ *Regina v. Morin*, 37 C.R. (4th) 395 (Ontario Ct. App. 1995).

⁹⁶⁴ *Morin*, 37 C.R. (4th) 395.

⁹⁶⁵ Lawrence Solan, Peter Tiersma, *Hearing Voices: Speaker Identification in Court*, 54 Hastings L. J. 373,393 (2003).

⁹⁶⁶ *Ibid.*

⁹⁶⁷ *Nilesh Dinkar Paradkar v. State of Maharashtra*, (2011) 4 SCC 143; *Shamsher Singh Verma v. State of Haryana*, (2016) 15 SCC 485; *Tukaram S. Dighole v. Manikrao Shivaji Kokate*, (2010) 4 SCC 329; *Shafhi Mohd. v. State of H.P.*, (2018) 5 SCC 311; *Sushil Singh v. Parbhu Narain Yadav*, 2005 SCC OnLine All 1381; *Anil Kumar Tito v. State (NCT of Delhi)*, 2015 SCC OnLine Del 9867.

⁹⁶⁸ (1976) 2 SCC 17.

⁹⁶⁹ 1985 Supp. SCC 611.

3. It shall be proved that the recording was accurately done. Any possibility of tempering shall be ruled out. The recorded tape shall be kept in a seal and safe custody;
4. The recording shall be a relevant fact as per the Indian Evidence Act.

The courts are of the view that voice identification evidence are not entirely accurate and can easily be tempered.⁹⁷⁰ In the case of *Devinder Singh v. Central Bureau of Investigation*⁹⁷¹ the High Court of Delhi refused to admit the voice identification evidence on the ground that the test of purity of the sample and reliability of the device was not established. With respect to the recording of a sample voice, the Supreme Court, in the case *Sudhir Chaudhary etc. v. State (NCT of Delhi)*,⁹⁷² has held that the sample of voice shall be taken by making the suspect read out a passage that shall not be the same as the disputed conversation.⁹⁷³ Such a passage shall only have important words from the disputed conversation. Such a practice would ensure that the sampling is fair and reasonable.⁹⁷⁴ These guidelines and judgments are indicative of court's concern for procedural propriety of the handling and sampling of the evidence. In relation to intrinsic reliability of voice identification evidence the court has held that voice identification evidence can only be corroborative evidence and not as sole evidence forming the basis of a judicial determination.⁹⁷⁵

4.3.1 REVIEW OF LOWER COURTS JUDGMENTS ON VOICE IDENTIFICATION

As mentioned in the introduction section 4.1, table 4.2, a total of 44 cases relating to voice identification evidence were identified. The review of these 44 judgments pertaining to voice identification has led to certain significant findings. Based on the inferences that can be drawn from these judgments the discussion has been divided into section. Each session deals with a particular issue.

4.3.1.1 Precautionary approach towards Voice Identification evidence

The following excerpts show that the courts perspective about the strength of voice identification evidence was that of caution. The judges displayed awareness about the weak nature of such evidence. Voice identification evidence have been termed as

⁹⁷⁰ *Nilesh Dinkar Paradkar Vs. State of Maharashtra*, 2011 STPL (Web) 291 (SC).

⁹⁷¹ (2014) SCC OnLine Del 1216.

⁹⁷² AIR 2016 SC 3772.

⁹⁷³ *Id.* para 13.

⁹⁷⁴ *Id.* para 13.

⁹⁷⁵ *Mahabir Prasad Verma v. Dr. Surinder Kaur*, (1982) 2 SCC 258, para 22.

secondary, corroborative, tricky, suspect, etc. Interestingly, the court has also touched upon the issue of “expectancy bias” in case of voice examination by an expert.⁹⁷⁶ Expectancy bias, as explained in the judgment, refers to tendency to develop a bias on repeated examination of voice by an expert. This is a probable cause of error in voice examination. As a counter measure against expectancy bias, it was suggested that the voice of the accused shall be mixed with the voice of other people.⁹⁷⁷ This will ensure that the result of voice examination is not such confirmation of a preconceived notion. Another reason mentioned for considered voice identification as less reliable is the likelihood of tempering with the samples.⁹⁷⁸ The relevant excerpts have been cited below:

- “Since the voice analysis is not an exact science like science of fingerprint analysis, wherein it can be conclusively said that the fingerprints of two persons on this planet cannot be the same. As voice identification can be very tricky thing, as it is common knowledge that people tend to remember faces much better than they remember voices. Another issue is "expectancy bias" which occurs when an expert listens to the same recording multiple times and develops an expectation as to the person's identity leading to a biased result. Therefore, testimony of an ear witness has to be carefully scrutinized in view of above factors in the present case.”⁹⁷⁹
- “In our opinion, the evidence of voice identification is at best suspect, if not, wholly unreliable. Accurate voice identification is much more difficult than visual identification. It is prone to such extensive and sophisticated tampering, doctoring and editing that the reality can be completely replaced by fiction. Therefore, the Courts have to be extremely cautious in basing a conviction purely on the evidence of voice.”⁹⁸⁰

⁹⁷⁶ *CBI Vs. Surender Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/192939506/> (last visited May 14, 2022) para 33.

⁹⁷⁷ *Cbi vs Rajesh Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/55932500/> (last visited May 14, 2022) para 49-50.

⁹⁷⁸ *CBI v. Pradeep Singh*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/64805397/> (last visited May 14, 2022) para 31; *CBI vs. Mohd. Asif Etc. Bearing on 5 April, 2017*, ‘Delhi District Court’ (*Indian Kanoon*) <https://indiankanoon.org/doc/166195660/> (last visited May 14, 2022) para 136-137.

⁹⁷⁹ *CBI Vs. Surender Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/192939506/> (last visited May 14, 2022) para 33.

⁹⁸⁰ *CBI v. Pradeep Singh*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/64805397/> (last visited May 14, 2022) para 31.

- “As per law laid down, the tape-recorded conversation is at the best can be used as corroborative piece.”⁹⁸¹
- “The said audiocassettes are secondary evidence in nature.”⁹⁸²
- “He[expert] has also stated that CFSL does not give any report regarding the identification of a voice beyond reasonable doubt as it is not a scientific language. He has deposed that erasing, editing can be done in the conversation in the DVR as well as at the time of transfer of conversation into CD. Therefore, in the present case, editing and erasing cannot be ruled out. Therefore, in view of the afore mentioned circumstances, it is not safe to place reliance.”⁹⁸³
- “This Court is relying less on the finding of CFSL that the questioned voices are the voices of person whose sample voice was also sent for examination. The reason for the same is that the Hon'ble Supreme Court in the case of Nilesch Dinker Paradkar Vs State of Maharashtra, (2011) 4 SCC 143 has held that for voice identification, similar yardsticks be followed which are followed in test identification parade. There should be some mixing of the voices rather than sending the questioned voice and sample voice without disclosing the names of the persons whose conversations are sent for examination. In the case of Anil Kumar Tito @ Anil Kumar Sharma @ Titto Vs State NCT of Delhi, Cri. Appeal No.66/2013 decided by Hon'ble Delhi High Court on 29.05.2015, it was held that the voice identification evidence would have little value when no attempt was made even to mix the voice of the accused with some other unidentified voice.”⁹⁸⁴

⁹⁸¹ *CBI v. Pradeep Singh*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/64805397/> (last visited May 14, 2022) para 88.

⁹⁸² *CBI Vs. Narender Kumar Mehta etc.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/4575088/> (last visited May 14, 2022) para 79.

⁹⁸³ *CBI vs. Mohd. Asif Etc. Bearing on 5 April, 2017*, ‘Delhi District Court’ (*Indian Kanoon*) <https://indiankanoon.org/doc/166195660/> (last visited May 14, 2022) para 136-137.

⁹⁸⁴ *CBI vs Rajesh Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/55932500/> (last visited May 14, 2022) para 49-50.

4.3.1.2 Heavy reliance and confidence in voice identification evidence

It was astonishing to note that, in contrast with observation made in 4.3.1.1, there were judgments wherein the court expressed high degree of confidence in the performance of voice identification technique. The reliability of the voice identification evidence was held to be comparable to that of DNA evidence.⁹⁸⁵ The expert in the case made vague assertions about the use of advanced technology to claim that voice identification is as accurate as DNA identification. This exaggerated claim was not questioned or doubted. On the contrary, the court based on this blatant assertion acknowledged that the expert has used “all scientific and technologically advanced methods.”⁹⁸⁶ Neither the name of the advanced technique used nor the methodology involved was enquired into. Similarly, in another judgment,⁹⁸⁷ the voice identification evidence was considered strong and credible. The court, without reference to methods employed or scientific studies, averred that science has advanced tremendously and the expert has made use of it. Moreover, in one instance, the court held that voice evidence is more credible than that of ocular/direct evidence as science is not prone to error whereas human beings are. This judgment was also devoid of any discussion about the specific technology that was used and found to have zero rate of error. The relevant excerpts have been cited below:

- “He further testified that due to advancement in computer technology, the accuracy of this science has increased and is not less than the DNA printing and finger printing examination. This part of testimony of PW25 is similar to what Hon’ble Justice Ranjana Prakash Desai in Ritesh Sinha (supra) opined in detail as to how the voice is very specific to individual and what are the new techniques like sound spectrograph machines adopted for voice prints. Sufficient it to say that PW25 is expert on voice identification and he used all scientific and technologically advanced methods to compare the voices before him.”⁹⁸⁸

⁹⁸⁵ *CBI Vs. Suresh Kr. Lakra etc.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/143890386/> (last visited May 14, 2022).

⁹⁸⁶ *Id.*

⁹⁸⁷ *CBI v. Rakesh Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/10001052/> (last visited May 14, 2022).

⁹⁸⁸ *CBI Vs. Suresh Kr. Lakra etc.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/143890386/> (last visited May 14, 2022).

- “Each person has distinctive voice with characteristics features. The technology is in a position to say whether two voice recordings are of the same person or of two different individuals. With the development of science and technology, the voice sample can be analyzed or measured on the basis of time, frequency and intensity of speech sound waves so as to compare and identify the voice of the person who must have spoken or participated in recorded telephonic conversations. Voice sample is “identification data” which can be used for the purposes of recognition of questioned voices. On examining the credentials of this witness, I find that he is an expert in the field of voice identification and used scientific and advanced methods to compare the questioned voices. The expert report is a strong piece of evidence and adds credibility to the genuineness of audio recordings.”⁹⁸⁹
- “I find that recorded conversations in this case are not only reliable and credible, rather their reliability is on higher footing than the oral testimony of the witnesses. Obviously, they are being relied upon, only on satisfaction about absence of any manipulation therein. As already observed herein above, there is limitation over the ability of a person to recollect the things in exact manner. It is very difficult if not impossible, to narrate an incident and a conversation in exact manner in which they take place. However, the scientific equipment make it possible for us to know the exact picture of an incident or conversation. The recorded conversations in this case are therefore, said to be on higher footing than oral testimony of the witnesses, because, they project all the conversations in exact and complete manner. In Naveen v. State of Uttaranchal, 2012 SCC OnLine Utt 2787, court made following observations in respect of scientific evidence: “Human being may tell a lie, but scientific evidence cannot. A fusion of law and medicine has gone a long way to nab the real culprits. The courts are required to read the mind of the witnesses to unearth the truth. The voyage to the discovery of

⁹⁸⁹ *CBI v. Rakesh Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/10001052/> (last visited May 14, 2022) para 70-71.

truth becomes easier when the courts rely upon science. Scientific evidence, unlike people, never tell a lie.”⁹⁹⁰

4.3.1.3 Terminologies used in expert report

Two judgments were identified wherein the expert explained the meaning of the terms used in the examination report. The experts, in both the judgments, used the term ‘probable’ to convey the extent to which the voices matched. This term does not have a definite connotation. And probable for this reason, the expert was asked to clarify what they meant by the term ‘probable.’ The two experts gave different answers. One expert claimed that probable meant 90% certainty, whereas the other expert claimed that probable is another term for 100% match. The court in former cases objected to the use of the term ‘probable’ holding that it is not definite opinion. And, in the other judgment, the court based on the clarification provided by the expert in the cross-examination accepted the testimony. The following are the relevant excerpts from the judgments:

- “As he has not given any definite opinion that the same was the voice of accused, the very fact that he has given a report that it was the probable voice of accused means that it may or may not be the voice of accused. Even the probability score of his opinion i.e the score of probability on percentage basis based on the score, which he has deposed in his examination-in-chief is not indicated therein. Does ‘probable’ means absolutely sure or there is one more degree to traverse i.e most probable beyond that or even beyond that point of certainty etc. indicating the scale of probability, and on what basis said word ‘probable’ has been used or to say there is any objective basis for saying so. Though, in his cross examination he has stated that the characteristics of the questioned voice and voice of specimen were matching more than 90%.”⁹⁹¹
- “So far as the use of expression ‘probable’ is concerned it was clarified by PW12 during his cross examination that in voice examination cases, the word ‘probable voice’ is interpreted as positive identification in their laboratory.

⁹⁹⁰ *State Of Rajasthan vs. Smt. Kalki And Another*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/30834680/> (last visited May 14, 2022) para 73.

⁹⁹¹ *CBI Vs. Surender Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/192939506/> (last visited May 14, 2022) para 32.

He has also deposed that the percentage of accuracy of the report is close to 100%.⁹⁹²

4.3.1.4 Reliance on Cross-examination

The following judgment elucidated the court's reliance on cross-examination for arriving at a conclusion regarding worthiness of the expert report. It is probable that during the cross-examination all the pertinent questions were asked and adequately answered by the expert, and therefore the court relied on the cross examination to assess the veracity of the expert report. Yet, this judgment has been cited to highlight the unwillingness of the court to discuss methodology and the veracity of the latest software technology or electronic devices used by the expert. None of the parameters on which a scientific technique shall be measures were found worthy of being mentioned in the judgment. It is not feasible to say with certainty that yet it is probably that the court never undertook the exercise of assessing the technique used by the expert.

- “The witness has confidently answered all questions put across during his cross-examination and there is no scope to disbelieve the expertise and the report. The witness[expert] has been cross examined on the point of voice testing and voice comparison and it is clear that electronic devices with latest software technology were used for the purpose of examination. The witness denied the suggestion that he has given favourable report to the CBI or that his report is perfunctory or scientifically incorrect. There is no reason to doubt the credibility of the expert witness, who has done his job appropriately and elaborately the procedure adopted by him during the auditory examination. The report is specific, clear, comprehensive and supported with reason. The scientific examination by the expert of the questioned recorded conversations has further added credibility to the case of prosecution.”⁹⁹³

⁹⁹² *Cbi vs Rajesh Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/55932500/> (last visited May 14, 2022) para 49-50.

⁹⁹³ *Cbi vs. Rajinder Singh Rana Etc.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/docfragment/131912957/?formInput=expert%20%20doctypes%3A%20delhid%20fromdate%3A%201-7-2016%20todate%3A%2031-7-2016> (last visited May 14, 2022) para 68.

In another judgment, an objection was raised regarding the risk of error in voice identification. The court dealt with the objection on the basis of the cross-examination of the expert. The following is the relevant paragraph from the judgment.

- “Question: Is it correct that there is an error in the range of 0 to 80 % in auditory examination of voice for comparison? Answer: Depending upon the quality of the voice, that is, if a person mimics or disguises his voice while giving sample, the percentage of error may be more, that is, upto 80%. But, if the sample quality is good, that is, given in the manner a person speaks, the error would be very less and could be even 0 error. The error in auditory examination is further verified by objective method, that is, voice spectrography, which has accuracy and reliability of voice comparison to the extent of more than 99% even if a person mimics or disguises in his sample voice. In his[expert] report he has given detail reasons and has also mentioned that question of specimen voices were subject to spectrographic analysis on Computer Voice Spectrograph for their Voice Grams and that the acoustic features namely formant frequency distribution, innotation pattern, frequency time coordination distribution, etc. correspond with their respective features in the specimen advances. [The court held that]] From this answer, two facts can be understood. First, there are chances of error. Second, with the help of scientific instrument i.e. voice spectrograph more than 99% accuracy is achieved in identification of voice. In view of this discussion, I hold that the voice identification report is scientific in nature and has to be accepted.”⁹⁹⁴

This is a highly specific example of the observation made above i.e., unwillingness of the court to deal with scientific parameters for assessment of scientific technique. The court in the excerpt cited above mentioned the features of the voices and the exactness of the examination done with the help of spectrograph but failed to take note of the basis of these claims. The claim of 99% accuracy made by expert and reiterated by the judge is not supported by any verification study or other scientific proof.

⁹⁹⁴*CBI vs. Anup Kumar Srivastava etc.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/147159774/> (last visited May 14, 2022) para 73-75.

Apart from above mentioned case, there were instances where the courts have discarded voice identification evidence mostly for want of procedural inaccuracies, such as discrepancies in expert testimony,⁹⁹⁵ irregularities in sampling,⁹⁹⁶ or lack of expertise.⁹⁹⁷ Likewise, there are other cases wherein the evidence was disregarded for want of certificate u/s 65-B of the Indian Evidence Act, 1872.⁹⁹⁸

4.3.2 INFERENCES REGARDING APPRECIATION OF VOICE IDENTIFICATION EXPERTS

Firstly, the review of judgments has shown that there are divergent views prevailing regarding the reliability and extent of accuracy of voice identification evidence. Section 4.3.1.1 and 4.3.1.2 have illustrated prevalence of contrary views among judges. While, in the absence of scientific studies, it is safe to deal with voice examination evidence with precaution; it is unsafe and baseless to hold the view that voice identification is highly reliable. Such perception is bound to misled a judge while weighing evidence.

There is no discussion or mention of scientific literature by judges to justify high or low confidence in the reliability of voice identification evidence. The only source of information referred to concerning the credibility of the voice identification technique is legal precedents. In fact, in one of the judgments, the court referred to a judgment concerning medical science to hold that voice identification is highly credible evidence.⁹⁹⁹ Further, the subjectivity of spectrographic analysis of voice has not been a

⁹⁹⁵ *CBI vs. S. V. Subba Rao & Anr.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/129570398/> (last visited May 14, 2022) para 125-126; *CBI vs. Lal Kishan @ Advani*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/129705751/> (last visited May 14, 2022) para 77.

⁹⁹⁶ *State vs. Ajay Mann on 30 January, 2020*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/67330492/> (last visited May 14, 2022) para 16.1 and 16.5.

⁹⁹⁷ *CBI Vs. Surender Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/192939506/> (last visited May 14, 2022) para 34.

⁹⁹⁸ *CBI v Pritam Lal Garg*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/91645822/> (last visited May 14, 2022); *CBI Vs. Vinod Attal etc.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/86233759/> (last visited May 14, 2022); *State vs . Sunil Kumar Etc. on 2 February*, ‘Delhi District Court’ (*Indian Kanoon*), 2016, <https://indiankanoon.org/doc/165069984/> (last visited May 14, 2022); *CBI vs. Mohd. Asif Etc. Bearing on 5 April, 2017*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/166195660/> (last visited May 14, 2022); *State vs Raj Kumar Yadav & anr. 1 on 29 November, 2017*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/49005390/> (last visited May 14, 2022); *State Vs. Tauhid Khan & Ors.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/59251772/> (last visited May 14, 2022); *CBI Vs. Narender Kumar Mehta etc.* (CC No.03/2010), ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/4575088/> (last visited May 14, 2022).

⁹⁹⁹ *State Of Rajasthan vs. Smt. Kalki*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/30834680/> (last visited May 14, 2022) para 73.

part of the discussion. It is only in one judgment that reference has been made to expectancy bias among judges.¹⁰⁰⁰

Another important feature noticed was heavy reliance on cross-examination of the expert. In one of the judgments the court has relied on cross-examination of the expert on the point that spectrographic examination of voice is 99% accurate.¹⁰⁰¹ Even with regard to the meaning of the terms used by the expert in the forensic report, the court has relied on the cross-examination of the expert. For instance, in a case where the expert has reported that the result of comparison of voice as a ‘probable’ match. The court relied on the cross-examination of the expert, wherein the expert deposed that the term ‘probable’ means 90% accurate.¹⁰⁰² Attributing precise meaning to the term ‘probable’ should have been made on some reasonable and sound basis or scientific study. Mere assertion shall not be enough for court to believe that probable match in case of voice identification means 90% accuracy. In another judgment, the court relied on the deposition of an expert that voice identification is 100% accurate.¹⁰⁰³ It is pertinent to note that nowhere has there been a reference to scientific literature with regard to such averments. An expert assists the court in scientific matters that are considered to be incomprehensible by lay people. At the same time, the gatekeeping function of the court entails that the assistance so received from an expert shall be independently assessed before any reliance is placed on.¹⁰⁰⁴ Once the opinion of an expert is accepted it becomes the opinion of court. Therefore, if the court is to accept the claims made by an expert, it shall be verified that there is sound basis in support of such claims. Non indulgence with scientific literature and reliance on unsupported claims made by an expert amount to relegation of gatekeeping responsibility to lawyers and experts by relying on cross-examination on scientific matters. Cross-examination as a safeguard is premised on three

¹⁰⁰⁰ *CBI Vs. Tulsi Ram*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/148867223/> (last visited May 14, 2022) para 25.

¹⁰⁰¹ *CBI Vs. Anup Kumar Srivastava etc.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/147159774/> (last visited May 14, 2022) para 73-75.

¹⁰⁰² *CBI Vs. Surender Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/192939506/> (last visited May 14, 2022) para 32.

¹⁰⁰³ *CBI vs Rajesh Kumar*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/55932500/> (last visited May 14, 2022) para 49-50.

¹⁰⁰⁴ Section 1.3 of chapter 1.

assumptions.¹⁰⁰⁵ There are, firstly, that lawyers are well cognisant of the scientific and technical nuances of expert evidence; secondly, that lawyers are efficient at highlighting the technical glitches in an expert report; and thirdly, that judges are aware of the scientific factors to be considered while evaluating expert evidence.¹⁰⁰⁶ An empirical study by *Chan* showed that lawyers are not aware of the empirical research regarding voice identification evidence.¹⁰⁰⁷ Absence of scientific facts, studies and data in the discussion on voice identification evidence indicates that they were not considered in the evidence evaluation process. The judges seemed to have negated their gatekeeping function totally as experts were not asked to provide scientific proof of such high claims. Mere assertions with scientific proof by experts are treated as gospel truth, especially by experts from government forensic labs that are seen as independent and objective experts.¹⁰⁰⁸ These findings are a cause of concern as in the U.S.A. around 17 people have been wrongfully convicted on the basis of voice identification evidence.¹⁰⁰⁹

It shall be noted that the review was limited to the issue of reliability of voice identification evidence. Other issues, such as power of investigating officer to take voice sample, violation article 20 of the Indian Constitution, were the sample taken voluntarily etc., were not made part of the discussion as that would amount to digression from the objective of the study.

4.4 DNA EVIDENCE

DNA is considered the most advanced sub-field of forensic sciences and is, therefore, considered as a gold standard in relation to other forensic sciences. There is no forensic method other than DNA that has the potential to connect the evidentiary sample to its source with a high degree of certitude.¹⁰¹⁰ It is the result of DNA technology that the wrongly decided cases wherein biological evidence was available could be overturned

¹⁰⁰⁵ Ryan Chan, *The Empirical Psychological Science behind Ad Hoc Expert Voice Identification Evidence*, 39 U. Tas. L. REV. 23,35 (2020).

¹⁰⁰⁶ *Ibid.*

¹⁰⁰⁷ *Ibid.*

¹⁰⁰⁸ *CBI Vs. Tulsi Ram*, 'Delhi District Court' (*Indian Kanoon*), <https://indiankanoon.org/doc/148867223/> (last visited May 14, 2022) para 25.

¹⁰⁰⁹ Lirieka Meintjes-van der Walt, *Voice Identification and Ear-Witnessing in the Dock*, 31 S. AFR. J. CRIM. JUST. 391,409 (2018).

¹⁰¹⁰ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 7 (2009).

and the innocent people could be exonerated of the charges. It is important to note that DNA, when it was first introduced in courts in the 1980s, was not as scientifically sound and reliable as it is today.¹⁰¹¹ The technique was subjected to severe criticism. The National Research Council in 1992 published a notification that “no laboratory should let its results with a new DNA typing method be used in court unless it has undergone proficiency testing via blind trials.”¹⁰¹² The DNA technology since then has undergone radical transitions and has attained capacity to individualise samples to a great extent.¹⁰¹³ DNA technology has also heightened the bar of reliability for other forensic techniques.

The Supreme Court of India and the High Courts have shown high regard for DNA evidence. The Supreme Court of India has held that a DNA expert report shall be admitted in evidence without hesitation provided there are no lapses in quality control of sample conservation and preservation.¹⁰¹⁴ It has been held that DNA technology has helped the legal system both at the stage of investigation and at the stage of trial.¹⁰¹⁵ The confidence that courts have in the performance of DNA evidence is evident from the fact that courts have on numerous occasions held that identification via DNA technology is an exact science and the results of DNA testing are hundred percent accurate.¹⁰¹⁶

The only concern that courts have with respect to DNA evidence is the need to maintain quality checks against contamination of the sample, sample mixing, complete digestion of the sample with appropriate enzymes, etc.¹⁰¹⁷

Further, giving preference to other evidence in contrast with the DNA results has been prohibited by courts.¹⁰¹⁸ Though, there have been occasions where the court chose not

¹⁰¹¹ *Id.* at 40.

¹⁰¹² National Research Council, *DNA Technology in Forensic Science*, Washington, DC: National Academy Press 55 (1992).

¹⁰¹³ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 41 (2009).

¹⁰¹⁴ *Mukesh v. State (NCT of Delhi)*, (2017) 6 SCC 1, para 228.

¹⁰¹⁵ *Id.* para 216.

¹⁰¹⁶ *Mukesh v. State (NCT of Delhi)*, (2017) 6 SCC 1, para 461; *Nandlal Wasudeo Badwaik v. Lata Nandlal Badwaik*, (2014) 2 SCC 576, para 19-20; *Santosh Kumar Singh v. State*, (2010) 9 SCC 747, para 71; *Kamti Devi v. Poshni Ram*, (2001) 5 SCC 311, para 10.

¹⁰¹⁷ *Pantangi Balarama Venkata Ganesh v. State of A.P.*, (2009) 14 SCC 607, para 41; *Anil v. State of Maharashtra*, (2014) 4 SCC 69, para 18.

¹⁰¹⁸ *Santosh Kumar Singh v. State*, (2010) 9 SCC 747, para 65.

to consider the DNA evidence for the report of the expert lacked relevant scientific data or information.¹⁰¹⁹

4.4.1 REVIEW OF LOWER COURT JUDGMENTS ON DNA EVIDENCE

As shown in table 4.2, a total of 42 cases relating to DNA evidence were analysed. The discussion on DNA evidence has been classified based on the themes that emerged after judgment analysis.

4.4.1.1 DNA evidence considered as important evidence

Keeping in view the accuracy and reliability of the DNA technology, several judges held that DNA evidence is an important piece of evidence. Judges have displayed a firm faith in the performance and ability of the DNA evidence to accurately identify the source. It has also been termed as the most important piece of evidence. It was given primacy over and above other evidence. This is an exceptional observation as forensic evidence are generally considered as secondary to direct evidence. The robust and highly accurate technology behind DNA evidence has afforded DNA evidence the status and importance that no other forensic evidence enjoys. A DNA match was considered as a clear and categorical proof of the identity of the person whose DNA was found at the scene of crime. The relevance and reliability of DNA evidence is so well settled and acknowledged that it cannot be rebutted casually by reference to some text and literature. Any objection raised against DNA evidence shall be debated and contested in detail in order to be effective. In one of the judgments the credibility of the DNA report was sought to be impinged on the ground that there were certain errors in the procedure carried out for DNA examination i.e. allelic charts were not filed with the expert report.¹⁰²⁰ The court held that such errors do not render the report inadmissible. The reasoning provided for the same is as follows:

- “Comparison of allelic details is different from comparison of finger print and handwriting because in comparing finger print and handwriting reports may differ, but in comparing the DNA profile, no expertise is required. Expertise is required in generating DNA profile, but once generated for different

¹⁰¹⁹ *Rajiv Singh v. State of Bihar*, (2015) 16 SCC 369, para 56,57.

¹⁰²⁰ *State vs Akbar @ Ganja Fir No.319/2017 Ps ... on 29 September, 2018*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/8639648/> (last visited May 23, 2022) para 26.4.

Exhibits, the comparison of allelic details do not require much expertise and the conclusion of such comparison cannot differ in view of the science involved in comparison of DNA profiles.”¹⁰²¹

An important inference that may be drawn from the paragraph quoted above is that the element of subjectivity associated with fingerprint comparison has been acknowledged by the judge in the case. The court has acknowledged that comparison of fingerprint by different expert may lead to different results. Whereas, this subjectivity is not present in case of DNA profile comparison. This also lends credibility to the result of DNA comparison. The following are some of the relevant excerpts in this regard:

- The DNA profiling report given by FSL; Delhi is very important piece of evidence. Certainly, being not proved the Ld. JJB should have considered this report.¹⁰²²
- The most vital evidence to connect all these accused persons with this crime is the DNA report. The DNA is an individual characteristic of each individual and is most important thing for identity of an individual.... Matching of DNA profile through DNA report i.e., Ex.PW25/A clearly connect the accused persons with commission of crime.¹⁰²³
- And, in any case, the expert's opinion has been given immense acceptability and should be given primacy and should not be brushed aside merely by referring some authoritative text unless the expert is given an opportunity to refer and consider that particular text/authority.¹⁰²⁴

4.4.1.2 Terms used in DNA evidence report

It was found that various terms have been used in relation to a DNA match in expert reports. The DNA report in certain judgments termed the result of DNA testing in terms

¹⁰²¹ *State vs Akbar @ Ganja Fir No.319/2017 Ps ... on 29 September, 2018*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/8639648/> (last visited May 23, 2022) para 26.4.

¹⁰²² *Vijay Kumar vs The State (Govt. Of NCT of Delhi) on 6 January, 2016*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/134009675/> (last visited May 23, 2022) para 10.

¹⁰²³ *Sc No.35/14 State vs . Mahender @ Ganja Etc. 1/69 on 10 June, 2016*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/92373938/> (last visited May 23, 2022) para 192.

¹⁰²⁴ *S.C. No. 27765/2016 State vs . Manoj @ Krishna @ Eilli 1 Of 16 on 26 April, 2018*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/51976449/> (last visited May 23, 2022) para 25.

such as ‘similar’.¹⁰²⁵ Whereas the terms used in some judgments were more emphatic like the samples ‘matched’¹⁰²⁶ or the samples are ‘consistent’ with each other.¹⁰²⁷ There is no discussion concerning the reason behind the use of different terms or the meaning assigned to these terms by the expert. The usage of either emphatic or less persuasive terminologies does not seem to have made a difference to the strength of DNA evidence. There were certain judgments wherein the DNA samples did not match.¹⁰²⁸

4.4.1.3 Procedural impropriety

Any lacunae in proof of collection, preservation and handling of DNA samples is regarded as a major concern and renders the DNA evidence as ineffective.

In cases where the collection DNA evidence is not duly proved the courts have discarded the evidence. For instance:

“As far as DNA test is concerned it may be noted that PW-7 Ram Milan is the witness who as per prosecution case had collected the blood sample of Smt. Hasmat Jahan mother of the deceased. He has turned hostile on this point and as per him Dr. R.K. Pandey has collected the same. Dr. R.K. Pandey is not a witness. In view of this, it cannot be said that DNA report Ex. PW-29/A has been duly proved by the prosecution.”¹⁰²⁹

Likewise, the court has not considered DNA evidence in cases where the DNA sample is not apt for examination or could not be extracted. The following case show that DNA examination failed as the sample had degraded.

¹⁰²⁵ *State vs. Sushil Bara Etc. on 10 October, 2018*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/88567857/> (last visited May 23, 2022).

¹⁰²⁶ *State vs Amrit Lal on 27 January, 2020*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/57833941/> (last visited May 23, 2022), Sc No. 58843/16 *State vs . Ram Prakash @ Avinash on 13 March, 2018*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/72069606/> (last visited May 23, 2022).

¹⁰²⁷ *State vs 1. Danish on 24 February, 2016*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/59668698/> (last visited May 23, 2022).

¹⁰²⁸ *Fir No. 227/15 State vs . Jitender Kumar Ps Pt. Street U/S ... on 28 February, 2017*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/5315489/> (last visited May 23, 2022); *State vs Mohd. Ibrahim Ansari, S/O. Mohd. on 2 May, 2018*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/117521380> (last visited May 23, 2022).

¹⁰²⁹ *State vs. Mohd. Zakir Etc., ‘Delhi District Court’* (*Indian Kanoon*), <https://indiankanoon.org/doc/4315010/> (last visited May 23, 2022) para 66.

- “DNA profile could not be generated from the source of exhibit ‘1’ due to degradation of sample. Hence matching of exhibit ‘2’ with exhibit ‘1’ could not be done.”¹⁰³⁰
- “DNA profile could not be generated from the samples taken from dead body because of degeneration of the sample as the tooth was having cavity and hair were without root.”¹⁰³¹

Thus, the court have not considered DNA evidence in cases where the procedural reliability or propriety was doubtful. Thus, the DNA extraction and comparison technology has not been questioned by courts, but there could be external factors or circumstances that may impinge on the reliability of DNA evidence. This has been termed as “validity as applied”.¹⁰³² The external reliability does not relate to the intrinsic reliability of a forensic technique. It is dependent on the facts and circumstances of the case. The external reliability of any technique can be called into question irrespective of the robustness of the forensic technique. These are factual considerations.

4.4.1.4 DNA vis-à-vis other evidence

Surprisingly, in some of the judgments the courts had to give preference to other evidence and neglect the DNA report. The reason behind this, as can be understood from the facts of the case, is that in order to decide a case the court has to ascertain if the chain of events is complete. DNA report could relate to one of the events in the entire series of events. And, if the series is not complete, then the DNA report alone cannot be the basis of the judgment. The same was asserted by one of the participants of the interview as discussed in chapter 5, section 5.4.1.1. The relevant excerpts of judgments relating to such situations are:

- “Though it is material evidence against the accused, yet it is also not disputed proposition of law that expert opinion is subject to ocular evidence only and it cannot be sole basis of conviction in isolation to ocular evidence especially

¹⁰³⁰ *State vs . Afjal Khan*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/188290534/> (last visited May 23, 2022) para 22.

¹⁰³¹ *State vs Manish Kumar & Anr.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/65723673/> (last visited May 23, 2022) para 17.23.

¹⁰³² President’s Council of Advisors on Science and Technology, *Report to the President Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*. Washington, DC: Executive Office of the President, 5 (2016).

when the incident itself become doubtful. Contrary to it, accused has tendered an explanation that he had a quarrel with complainant under the influence of liquor prior to the incident and during this quarrel he was assaulted by the complainant and caused head injury and during this process his blood might have fallen on the shirt of the injured. Though accused has not made any compliant against this incident, yet it may not be ruled out, as the entire incident is very calculative and having a number of loop holes. If ocular evidence is not reliable then the scientific evidence cannot be used to prove the guilt and to base the conviction of the accused.”¹⁰³³

- “The death of Tanisha had taken place within the house of the accused persons. As stated above, there is nothing on record to prove the presence of the accused Damodar in the house at the relevant time or any other circumstantial evidence to connect him or Sanjay with the offence in question. Although the death of Tanisha is very unfortunate but only because of that, the court is not expected to find an excuse to hold the accused persons guilty for the offence in question.... As per the result of the DNA profile generated from the gauge cloth piece of the deceased was found matching with the DNA profile generated from the clothes of the deceased. Even this FSL result is of no help to the prosecution in proving its case. A criminal trial is not a fairy tale wherein one is free to give flight to one’s imagination and fantasy. Crime is an event in real life and is the product of an interplay between different human emotions. In arriving at a conclusion about the guilt of the accused charged with the commission of a crime, the court has to judge the evidence by the yardstick of probabilities, its intrinsic worth and the animus of witnesses. It is settled law that the burden of proof in a criminal trial never shifts and it is always on the prosecution to prove its case beyond reasonable doubt on the basis of acceptable evidence.”¹⁰³⁴

¹⁰³³ *State vs. Shahrukh @ Abdul Wahid*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/116427518/> (last visited May 23, 2022) para 13.

¹⁰³⁴ *State vs . Damodar And Anr.*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/68143128/> (last visited May 23, 2022) para 39-41.

In certain judgments DNA was not relied upon as it was not corroborated with any ocular evidence.¹⁰³⁵ As has been explained above, DNA evidence is one piece of evidence and, in certain situations, it may not be enough to establish the complete chain of events. There may be situations where contrary direct evidence are present which makes reliance on DNA evidence improbable. One such case has been cited below. If the prosecutrix herself denies the involvement of a person, then the matching of that person's DNA may be inconsequential.

“It is evident from the testimony of prosecutrix that she has not alleged that accused established physical relations with her. Once, the prosecutrix has denied the physical relations between her and the accused, the presence of DNA of the accused on the clothes of the prosecutrix cannot conclusively prove the guilt of the accused. In absence of any ocular evidence, forensic evidence cannot be taken into account to establish the guilt of the accused as the expert evidence is only considered as a corroborative piece of evidence. Conviction of the accused merely on the basis of forensic evidence would be a dangerous proposition particularly when the prosecutrix and her parents have not at all supported the case of prosecution.”¹⁰³⁶

4.4.2 INFERENCE REGARDING APPRECIATION OF DNA EVIDENCE IN LOWER COURTS

The credibility of the DNA evidence is well-appreciated by courts. The only reservation shown by judges while appreciating DNA evidence is regarding the proper sampling, collection and preservation of the DNA sample. Also, it is trite to mention that, in a factual matrix of a case, the whole chain of event shall be complete to reach a just decision. DNA, therefore, cannot be the sole piece of evidence on the basis of which the case can be decided. Apart from these limitations, the appreciation of DNA evidence in courts is in consonance with the scientific knowledge that DNA evidence is impeachable.

¹⁰³⁵ *State vs. Azad*, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/101150026/> (last visited May 23, 2022); 2016, Sc No: 57749/16 *State vs. Amit* on 7 November, 2016, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/156658324/> (last visited May 23, 2022).

¹⁰³⁶ *State vs. Rahul Kumar* on 27 August, 2016, ‘Delhi District Court’ (*Indian Kanoon*), <https://indiankanoon.org/doc/80681373/> (last visited May 23, 2022) para 14.

4.5 HANDWRITING EVIDENCE

Handwriting refers to writing style. It could be cursive, script style, printing, signature, numerals, writing in signs, etc.¹⁰³⁷ Handwriting comparison is an examination of certain peculiar features, characters or attributes of a questioned writing with an admitted writing sample.¹⁰³⁸ It is based on the premise that handwriting has unique markings that are acquired as a habit.¹⁰³⁹ These unique markings are also referred to as discriminating elements.¹⁰⁴⁰ It is believed that the likelihood of two people having the same or similar discriminating elements is very low.¹⁰⁴¹ A handwriting examiner looks at the intrapersonal and interpersonal variability of a person's writing.¹⁰⁴² Intrapersonal variations refer to variations that naturally occur in the writings of the same person.¹⁰⁴³ Whereas, interpersonal variations refer to differences that are present in the writing of possible writers.¹⁰⁴⁴ The degree and nature of variations between two handwriting sample shall determine whether the samples are from the same source or not.¹⁰⁴⁵ For instance, if the variations between two samples are more intrapersonal than interpersonal, then the chances that the same person is the writer of the two samples are more. And, if the variations between two samples are interpersonal, then it is concluded that the two samples are written by two different persons.

Handwriting is apparently the most commonly used forensic technique in courts in India. Both the interviews with judges and the analysis of judgments have revealed that majority of the cases relate to handwriting evidence.¹⁰⁴⁶ The majority of the participants of the survey study had dealt with handwriting evidence. Despite the popularity and frequent usage of handwriting evidence, the reliance on results of handwriting examinations is quite low.¹⁰⁴⁷ Kulik notes that the prime reason for this low level of

¹⁰³⁷ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 163 (2009).

¹⁰³⁸ *Id.* at 165.

¹⁰³⁹ *Id.* at 43.

¹⁰⁴⁰ *Id.* at 165.

¹⁰⁴¹ *Ibid.*

¹⁰⁴² *Ibid.*

¹⁰⁴³ *Ibid.*

¹⁰⁴⁴ *Ibid.*

¹⁰⁴⁵ *Ibid.*

¹⁰⁴⁶ See section 5.3 of chapter 5 and table 4.2 of this chapter.

¹⁰⁴⁷ Kulik, S., & Nikonets, D., *Forensic handwriting examination and human factors: Improving the practice through automation and expert training*, 2016 Third International Conference on Digital Information Processing, Data Mining, and Wireless Communications (DIPDMWC) 221 (2016).

confidence in the performance of handwriting experts is the element of subjectivity inherent in the technique.¹⁰⁴⁸ It is a common occurrence that experts called by the two opposing parties give contrary opinions on the same set of samples. The scope for subjectivity and, hence, manipulation is a serious concern which impacts the credibility of handwriting expert report. Further, the reports of handwriting experts are presented to the court in categorical terms such as ‘match’ or ‘no-match’.¹⁰⁴⁹ Requisite information regarding element of subjectivity or uncertainty of conclusions is not provided to the court.¹⁰⁵⁰ Thus, the courts are not made aware of the information that would enable them to make an accurate assessment of the probative worth of such reports.

Also, the individuality of a person’s writings has not been established by way of scientific studies and, therefore, evidence of handwriting expert is not relied on too heavily.¹⁰⁵¹

In relation to identification of signature the High Court of Andhra Pradesh in the case of *Nallu Bathu Purnaiah Vs. Mallika Arjun Rao*¹⁰⁵² has held that it can be proved by either of the following means: direct evidence, familiar evidence, comparison by court, admission by the parties, or circumstantial evidence. Familiar evidence refers to the evidence of a person who is familiar with the handwriting of the suspect by virtue of frequent observation or experience. This has been dealt with in section 47 of the Indian Evidence Act. Comparison of handwriting can be carried out by the judge himself. This has been dealt with in section 73 of the Act. This section empowers the court to compare the two samples itself.

Comparison by a handwriting expert comes in the category of circumstantial evidence and is covered by section 45 of the Act. Comparison by an expert is considered scientific in nature as compared to comparison by the court or a person familiar with the handwriting.¹⁰⁵³ And, the Supreme Court has, in the case of *Ram Narain v. State of Uttar Pradesh*,¹⁰⁵⁴ held that the report of a handwriting expert being fallible shall be dealt

¹⁰⁴⁸ *Ibid.*

¹⁰⁴⁹ Martire, K.A., Grown, B. & Navarro, D.J., *What do the experts know? Calibration, precision, and the wisdom of crowds among forensic handwriting experts*, 25 *Psychon Bull Rev.* 2346–2355 (2018).

¹⁰⁵⁰ *Ibid.*

¹⁰⁵¹ S.N. Sargur, S.-H. Cha, H. Arora, and S. Lee., *Individuality of handwriting*, 47(4) *Journal of Forensic Sciences* 1-17,1 (2002).

¹⁰⁵² AIR 2003 AP 201.

¹⁰⁵³ *Lalit Popli v. Canara Bank*, (2003) 3 Supreme Court Cases 583.

¹⁰⁵⁴ (1973) 2 Supreme Court Cases 86.

with great caution and suspicion. The court also held that if such an opinion is relevant and there is other supporting evidence, then the report shall not be brushed aside merely on the ground that such opinion is fallible and inconclusive. Recently, in the year 2015, the Supreme Court observed that the court shall, before relying on the report of a handwriting expert, look at the other evidence in support of the report and shall also analyse the content of the report.¹⁰⁵⁵ The emphasis is being placed on the requirement that the court shall satisfy itself that the report is worthy of being considered.¹⁰⁵⁶ The Indian Evidence Act has expressly given to court the power to compare the admitted and the disputed sample on its own and form an independent conclusion, irrespective of the report of an expert.¹⁰⁵⁷ At the same time, the courts should be wary of making a comparison itself *Fakhruddin v. State of Madhya Pradesh*.¹⁰⁵⁸ It is for this reason that the Supreme Court in the case of *Gulzar Ali v. State of H.P.*¹⁰⁵⁹ observed that the power under section 73 shall be used sparingly and the opinion of an expert shall be upheld, especially in cases of doubt. After all, an expert is not an accomplice in the case.¹⁰⁶⁰ Therefore, to abandon the report of an expert or to insist that it shall not be acted on without corroboration is not justified.¹⁰⁶¹ The court shall not step into the shoes of an expert.¹⁰⁶² The court's role shall be limited to verifying and appraising the reasoning given by an expert.¹⁰⁶³ This exercise is meant to scrutinize the expert report to the satisfaction of the court.¹⁰⁶⁴

The power under section 73 shall be exercised in cases where neither party brings expert evidence to the court or when the two experts present contrary opinions to the court.¹⁰⁶⁵ In such situations, the court has plenary power and a duty to make the comparison itself.¹⁰⁶⁶ The court shall not avoid making the comparison itself in such situation merely on the pretext that it has no expertise in the matter.¹⁰⁶⁷ An apt example of such a situation

¹⁰⁵⁵ *Tomaso Bruno Vs. State of U.P.*, (2015) 7SCC 178.

¹⁰⁵⁶ *Lalit Popli v. Canara Bank*, (2003) 3 Supreme Court Cases 583.

¹⁰⁵⁷ *Ibid.*

¹⁰⁵⁸ AIR 1967 SC 1326.

¹⁰⁵⁹ 1998 (2) SCC 192.

¹⁰⁶⁰ *Murari Lal v. State of MP*, AIR 1980 SC 531.

¹⁰⁶¹ *Ibid.*

¹⁰⁶² *Fakhruddin v. State of Madhya Pradesh*, AIR 1967 SC 1326.

¹⁰⁶³ *Ibid.*

¹⁰⁶⁴ *Ibid.*

¹⁰⁶⁵ *Murari Lal vs State of UP*, AIR 1980 SC.

¹⁰⁶⁶ *Ibid.*

¹⁰⁶⁷ *Ibid.*

is the case of *Rattan Singh Vs Nirmal Gill*.¹⁰⁶⁸ In this case, the two experts called to court by the two opposite parties gave contradictory findings in court concerning the same set of samples. The court, in this case, chose not to rely on either of the expert reports and decided the case on the basis of other available evidence.

The evidentiary value of handwriting expert evidence has been the subject of discussion in many cases.¹⁰⁶⁹ The courts have time and again held that handwriting evidence being fragile, inconclusive, and weak carries with it the risk of being unreliable. Sole reliance on handwriting evidence is full of hazards and risks. The best way to deal with such evidence is to seek corroboration with the help of other evidence. This is not to say that corroboration must invariably be sought.

Experts, like all other human being, are fallible and may make errors honestly or unconsciously.¹⁰⁷⁰ The chances of error are more in case the technique/science involved is not fully evolved.¹⁰⁷¹ Conversely, with the advancement of a technique the chances of error diminish.¹⁰⁷² For example, DNA technology in 1990 was not unreliable.¹⁰⁷³ But, after more research was carried out and DNA technology was further developed, it emerged as ‘gold standards’ of forensic science.¹⁰⁷⁴ The shortcomings of the technology can be fixed when more and more scientific investigations are completed, including validation tests. Or other testing techniques might be developed that produce outcomes that are more accurate.

As regards the need for corroboration, the Supreme Court in the case of *State Of Maharashtra v. Sukhdeo Singh and anr. etc.*¹⁰⁷⁵ observed that the science of handwriting comparison is not a perfect science. It is based on the principle that people, over a course of time, acquire a peculiar and distinct manner of writing which makes it possible to

¹⁰⁶⁸ (Civil Appeal Nos. 3681/3682 of 2020) decided on 16.11.2020, the Hon'ble Apex Court.

¹⁰⁶⁹ *Magan Bihari Lal v. State of Punjab*, *Ram Chandra v. State of U.P.* AIR 1957 SC 381; *Ishwari Prasad v. Md. Isa*, AIR 1963 SC 1728; *Shashi Kumar v. Subodh Kumar*, AIR 1964 SC 529; *Fakhruddin v. State of M.P.*, AIR 1967 SC 1326.

¹⁰⁷⁰ *Murari Lal v. State of MP*, AIR 1980 SC 531.

¹⁰⁷¹ *Ibid.*

¹⁰⁷² *Ibid.*

¹⁰⁷³ REPORT TO THE PRESIDENT, FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE COMPARISON METHODS, 1,2 (Sep, 2016).

¹⁰⁷⁴ *Ibid.*

¹⁰⁷⁵ 1992 AIR 2100 SC.

identify the author.¹⁰⁷⁶ Further, the experts tend to favour the parties engaging them.¹⁰⁷⁷ This is evident from the fact that courts are often confronted with contrary opinions on the same set of samples.¹⁰⁷⁸ Therefore prudence demands that the handwriting expert report shall be acted on with extra caution and only if the court is satisfied with the reasoning behind the conclusions drawn in the report, absence of bias, the competence and credibility of the expert.¹⁰⁷⁹ The courts tend to not base their decisions solely on handwriting evidence and only when there are other corroborating evidence that the report is relied on.¹⁰⁸⁰ There may be situations where the disputed writing has certain extremely peculiar and striking features that are hard not to notice.¹⁰⁸¹ In such cases, the court may choose to act on the sole testimony of an expert.¹⁰⁸² Overall, the crux of the discussion is that the facts and circumstances of a case shall determine the appropriate course of action.¹⁰⁸³

In *Shashi Kumar v. Subodh Kumar*, the court had two attesting witnesses testify against a handwriting expert opinion. The court held that handwriting evidence cannot replace substantive evidence, i.e., testimony of two attesting witnesses. And, reliance was not placed on the report of the handwriting expert. Simultaneously, it shall be kept in mind that this is only a rule of prudence and not a rule of law.¹⁰⁸⁴ It is unjustified to treat all handwriting expert opinions with suspicion or as inferior to other evidence.¹⁰⁸⁵ Rejecting an expert opinion that is well-grounded in reasoning is not legally tenable.¹⁰⁸⁶ The test of probative worth of an expert opinion is the acceptability of the reasoning given in the report.¹⁰⁸⁷ An expert is duty-bound to present to the court the reasons for arriving at a particular finding.¹⁰⁸⁸ Based on the careful examination of the reasoning, the court makes an independent judgment as to the evidentiary worth of the report.¹⁰⁸⁹ Thus, it

¹⁰⁷⁶ *Id*, at para 120.

¹⁰⁷⁷ *Ibid*.

¹⁰⁷⁸ *Ibid*.

¹⁰⁷⁹ *Ibid*.

¹⁰⁸⁰ *Ibid*.

¹⁰⁸¹ *Ibid*.

¹⁰⁸² *Ibid*.

¹⁰⁸³ *Ibid*.

¹⁰⁸⁴ 1992 AIR 2100 SC.

¹⁰⁸⁵ *Murari Lal v. State of MP*, AIR 1980 SC 531,

¹⁰⁸⁶ *Ibid*.

¹⁰⁸⁷ *Dacie v. Edinburgh Magistrate*, 1953 S.C. 34.

¹⁰⁸⁸ *Ibid*.

¹⁰⁸⁹ *Ibid*.

may be concluded that it is safe to seek corroboration of handwriting evidence. At the same time, if the handwriting evidence is convincing and there is nothing that clouds the handwriting evidence with doubt, the court need not look for corroboration.

4.5.1 REVIEW OF LOWER COURT JUDGMENTS ON HANDWRITING EVIDENCE

A total 554 cases relating to handwriting evidence were analysed. The analysis of the judgment has been divided into sections. Each session relates to a particular issue.

4.5.1.1 Probative worth of Handwriting evidence

Certain judgments from the lower courts highlighted the general practice that the opinion of an expert is never conclusive.¹⁰⁹⁰ It is only an opinion and the court is duty bound to appraise the credibility of the opinion.¹⁰⁹¹ In the following judgements, the court held that handwriting expert evidence is only a corroborative piece of evidence and cannot be relied on solely. The courts have terms handwriting evidence as a weak kind of evidence. Yet, it is worth noting that despite the weaknesses, the courts have shown regard for it by hold that it is a vital proof and shall have to considered by the court unless specifically dislodged.

- “Thus, although hand writing expert report is referential but cannot be accepted in toto as a gospel truth. Also, the genuineness of Will cannot be solely based upon the signatures of testator which is just one, although a vital factor, to be considered.”¹⁰⁹²

¹⁰⁹⁰*Veena Gupta vs . Deepak Rana*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/187983406/> (last visited May 25, 2022) ; *State vs Vikas Rana*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/75621257/> (last visited May 23, 2022); *Shri Satpal Singh vs Sh. Jit Singh*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/104706165/> (last visited May 23, 2022); *M/S. Trimurti Construction vs State*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/84572899/> (last visited May 23, 2022); *Sh. Narottam Singh vs Sh. Rajender Pal Singh*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/85439791/> (last visited May 23, 2022); *Cbi vs . S.K. Arora & Ors.*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/79615857/> (last visited May 23, 2022); *Shamim Bano vs Jalaluddin*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/46423141/> (last visited May 23, 2022) (last visited May 23, 2022); *Sandeep Sahni vs Central Bureau Of Investigation*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/101151055/> (last visited May 23, 2022); *State vs Ashok Kumar*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/176038618/> (last visited May 23, 2022).

¹⁰⁹¹ *Veena Gupta vs. Deepak Rana*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/187983406/> (last visited May 23, 2022), para 15.

¹⁰⁹² *Mrinal Chowdhury vs State*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/181246579/> (last visited May 25, 2022) para 12.45.

- “The only direct evidence available is the report of the handwriting expert and, though it is a weak kind of evidence, given the circumstances it has to be taken into consideration and the onus is upon the defendant to dislodge even the weakest of the evidence against it.”¹⁰⁹³

Thus, handwriting evidence may not be fully relied on, yet the presence of handwriting evidence is a significant finding. The report of a handwriting expert cannot be brushed aside merely because it is a fragile piece of evidence. Also, the above-mentioned rule requiring corroboration was relaxed in appropriate cases. That is to say that exception has been carved out to the rule requiring corroboration. The courts have held that if the circumstances permit the court may act upon uncorroborated testimony of the handwriting expert.

- “But, having due regard to the imperfect nature of the science of identification of handwriting, the approach, as we indicated earlier, should be one of caution. Reasons for the opinion must be carefully probed and examined. All other relevant evidence must be considered. In appropriate cases, corroboration may be sought. In cases where the reasons for the opinion are convincing and there is no reliable evidence throwing a doubt. The uncorroborated testimony of a handwriting expert may be accepted. There cannot be any inflexible rule on a matter which, in the ultimate analysis, is no more than a question of testimonial weight. We have said so much because this is an argument frequently met with in subordinate courts and sentences torn out of context from the judgments of this Court are often flaunted.”¹⁰⁹⁴
- “To say that conviction can be or cannot be based solely upon the report of hand writing expert would be misleading. The appropriate interpretation of Section 45 of Indian Evidence Act is that court is competent to form its own opinion on the point of identity of hand writing and for that purpose the court may call for the report of a handwriting expert. Therefore, the relevant fact before this court is the matching or non-matching of the hand writing of the accused with the questioned hand writing. If the hand writings match, there

¹⁰⁹³ *Smt. Kusum Vishwarkarma vs Canara Bank*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/198187536/> (last visited May 25, 2022) para 32.

¹⁰⁹⁴ *Judgment Title Cbi Hyderabad vs . K. Narayana Rao*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/147928683/> (last visited May 25, 2022) para 11.

cannot be any hitch in convicting the accused even if further corroborative evidence is not available.”¹⁰⁹⁵

- “Thus, there is no rule of law to the effect that opinion of handwriting expert must never be acted upon unless substantially corroborated.”¹⁰⁹⁶

The courts have made it abundantly clear that rule requiring corroboration is only a rule of precaution. The court are expected to adopt cautionary approach. This does not, however, bar the courts from acting solely on handwriting evidence. There is no mandate of law that calls for rigid application of this rule in case of handwriting evidence. It is a flexible rule that may be applied stringently or bypassed as per the situation. The circumstances of a case, the reasoning provided in the report, the convincing nature of expert testimony, absence of counter evidence, etc are the factors that shall determine how the court shall weight evidence. The issue of assigning probative weight to evidence can be decided based on a fixed body of rules. These are factual matters and require comprehensive deliberation keeping in view the entirety of the factual matrix. In short, there is no unqualified and conditional legal requirement that handwriting evidence shall not be relied on unless it is corroborated. It would be misleading and deceitful to hold that uncorroborated testimony of handwriting expert cannot be acted upon.

4.5.1.2 Factors affecting credibility of handwriting evidence

From the discussion in the previous section, it is made clear that worthiness of handwriting evidence is factual matter to be decided based on the facts of the case. The present section present discussion on various factors that affect the probative worth of handwriting evidence. In the case of *East Delhi Municipal Corporation vs Sh. Sanjay Bansal*, the court elaborated on the aspects of handwriting that shall be taken into consideration. The relevant excerpt from the judgments is:

“The relevancy of the opinion depends on many factors - i) qualification of the expert, ii) his expertise in the science by the number of opinion, which he gave, iii) the clarity and firmness of the signatures under comparison; iv)

¹⁰⁹⁵ *CBI vs. Ashok Pasrija*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/92219363/> (last visited May 25, 2022) para 52.

¹⁰⁹⁶ *State vs. V.C. Shukla*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/101258923/> (last visited May 25, 2022) para 102.

the data base i.e. the comparative signatures made available to the expert... Normal variations are common in the signatures of any person. A person does not make identical signatures but more importantly he makes/appends signatures which he [author] knows and the forgeror does not know.”¹⁰⁹⁷

In one another judgment the court has discussed the reasoning of the expert report in great details. The relevant excerpt has been cited below.

“Although, PW3 has given report related to the word 'Bhim', he did not give report on similarities or dissimilarities between the disputed and comparative second part 'Sen' of signatures of the testator. The report Ex. PW3/1 points out only very minute and subtle differences in formation of letters 'B', 'h', 'i' and 'm' in the disputed and comparative signatures of the testator. However, the inter se dissimilarities in the form and formation of said letters in the comparative signatures A1 to A16 are quite apparent and have been completely missed by PW3 in his report Ex. PW3/1. From the comparative / admitted signatures A1 to A16, one cannot find striking peculiarities and mannerisms which stand out to identify the handwriting of testator Sh. Bhim Sen.”¹⁰⁹⁸

Thus, the qualification of the expert, the number of cases in which he has testified as an expert, quality of the handwriting samples, the nature of variations, nature of similarities, etc. are the various features taken into consideration. Also, there may be similarities or dissimilarities that may not find mention in the expert report. The court may look into those aspects also that have been missed out by the expert in his report. The court shall, thus, actively appreciated the report and samples together to determine the probative worthiness of the evidence.

¹⁰⁹⁷ *East Delhi Municipal Corporation vs Sh. Sanjay Bansal*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/7715478/> (last visited May 23, 2022) para 13.5.

¹⁰⁹⁸ *Smt. Rama Sharma vs Smt. Usha Sharma*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/22047511/> (last visited May 25, 2022) para 20.

There are certain issues relating to “validity as applied”¹⁰⁹⁹ that may be consequential in appreciating to handwriting evidence. For instance, in certain cases the handwriting evidence was discarded for non-epistemic reasons, such as expert lacking requisite knowledge of the samples,¹¹⁰⁰ expert not being able to give satisfactory answers in cross-examination,¹¹⁰¹ use of photocopies for comparison,¹¹⁰² obtaining sample signature without the permission of the court,¹¹⁰³ sample of writing were kept in an unsealed conditions,¹¹⁰⁴ or not being able to prove expertise.¹¹⁰⁵ These issues do not relate to the reliability of the technique as such. A forensic or scientific technique when applied in real life situation is bound to be impacted by procedural and non-epistemic factors. The controlled circumstance provided for application of a technique in a laboratory are not present in ordinary situation. Therefore, irrespective of the intrinsic reliability of any technique, the fate of its reliability in the form of an evidence shall be dependent on factual matters.

¹⁰⁹⁹ See section 4.4.1.3

¹¹⁰⁰ *Sh. Iqbal Ansari vs Sh. Ataurreham*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/113609609/> (last visited May 25, 2022), para 60.

¹¹⁰¹ *Sh. Ajnesh Aeron vs Sh. Irfan*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/11626159/> (last visited May 25, 2022); *Cbi vs . R.K. Verma & Ors.*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/23586452/> (last visited May 25, 2022); *Vidhyawati vs Sh. Sushil Pachori*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/19087414/> (last visited May 25, 2022); *Sh. Vinay Sakhuja vs State*, (last visited May 25, 2022) para 12.45 <https://indiankanoon.org/doc/5022143/> (last visited May 25, 2022); *Master Sachin v. State*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/5642686/> (last visited May 25, 2022); *Zaheerudin & Ors. vs Jamia Milia Islamia*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/125645292/> (last visited May 25, 2022); *Smt. Amarjeet Kaur vs State*, 2018, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/26759479/> (last visited May 25, 2022).

¹¹⁰² *Shakeela v. Varsha Lata*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/162118176/> (last visited May 25, 2022); *Cbi vs 1 L.K. Kaul*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/47643062/> (last visited May 25, 2022); *Shri Kranti Kumar Jain vs 1. Shri Giri Raj Tyagi*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/12368124/> (last visited May 25, 2022); *Bhupinder Singh vs The State / General Public*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/27480355/> (last visited May 25, 2022).

¹¹⁰³ *State vs . Mukesh Sharma*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/193429705/> (last visited May 25, 2022), para 31.

¹¹⁰⁴ *State vs . Puran Chand & Ors.*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/140378330/> (last visited May 25, 2022), para 12.

¹¹⁰⁵ *Shri Pankaj Sehrawat vs Shri Om Prakash*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/59716472/> (last visited May 25, 2022); *State vs. Madhavlan*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/55655825/> (last visited May 25, 2022).

4.5.1.3 Contradictory expert reports

Some judgments have revealed that, in case of handwriting evidence, contrary expert reports were presented in court by the opposing litigating parties. The court have considered it unsafe and unhelpful to rely on either of the reports in such cases. The court in such scenarios mostly discards both the opinion and decides the case on the basis of other relevant evidence. For instance:

- “It is thus explicit from reading of aforesaid judgments that it is not safe to rely upon either of the two expert reports because of divergent opinions.”¹¹⁰⁶
- “In this case, expert opinions were diversified and no help can be taken from the said opinions.”¹¹⁰⁷
- “Since both the expert witnesses have deposed in favour of their own clients, it is necessary to look for other evidence which the party have led in support of their causes to come to any conclusion in this case.”¹¹⁰⁸
- “Keeping in view the principal of law and the fact that there are two contradictory reports, in respect of the signatures of N.K. Lamba on Ex.DW1/16, the testimony of expert i.e., Dr. Reena Rani Gupta and Dr. R.K. Vij cannot be relied upon.”¹¹⁰⁹
- “Since both the experts deposed in favour of their clients it is imperative for the court to consider other evidences which the party have led in support of their causes.”¹¹¹⁰

It is a waste of evidence to not consider either report. One of the two reports is bound to be correct. The incapacity or inability to figure which report is correct adversely affects the interest of a litigating party. In fact, it is also possible that a party in order to make redundant the handwriting evidence of the other party may purposely present a

¹¹⁰⁶ *Sh. Om Prakash Verma vs Sh. Anil Kumar Verma*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/78736564/> (last visited May 25, 2022) para 45.

¹¹⁰⁷ *Shri Suhas Chand Gupta vs Nathu Pastry Shop*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/140116282/> (last visited May 25, 2022) para 28.

¹¹⁰⁸ *Kailash Rani vs Mohan Bir Singh*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/98464086/> (last visited May 25, 2022) para 18.

¹¹⁰⁹ *M/S. Ashlar Stones (P) Ltd vs M/S. Talwar Sons*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/174127465/> (last visited May 25, 2022) para 25.

¹¹¹⁰ *Kailash Rani vs Mohan Bir Singh*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/100372851/> (last visited May 25, 2022) para 18.

contradictory handwriting evidence. From the judgments, it seems that parties have been able to arrange for a manipulated handwriting expert report. Probable to counter such practice, the court in some cases of divergent opinions, chose to compare the handwriting itself under section 73 of the Indian Evidence Act.¹¹¹¹

- “The testimonies of the handwriting experts who deposed as PW3 and DW2 on behalf of the plaintiff and the defendant respectively, that they have given the respective contradictory reports in favour of the parties, who has engaged them for giving the said reports. Resultantly, the court did the comparing itself under section 73 of the Evidence Act.”¹¹¹²

The court could also choose to seek opinion of a court-appointed expert. But from the judgments it appears that this option was never exercised. The court took up the task of comparing the handwriting on its own. The court is empowered by virtue of section 73 of the Evidence Act to take handwriting samples and compare the questioned handwriting.

4.5.1.4 Private experts

Experts come to court to give independent and impartial assistance to court on matters relating to their expertise. They are expected to give report on the basis of their examination irrespective of the claims made by the party that has hired them. Expert who testifies in court could be a privately hired expert by a party, expert appointed by the court, or an expert associated with a government lab. In case of expert appointed by a party, it was observed that court seemed to have been suspicious of the genuineness of the report findings. Infact in one of the judgments the court expressly questioned the integrity of the report and stated that a private expert is bound to give a favourable report.¹¹¹³ Doubts regarding credibility of the report are accentuated if there are contradictory evidence. In one instance, the report of expert was found to be baseless

¹¹¹¹ *Sh. Dale Ram vs Sh. Mahinder Singh*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/138749179/> (last visited May 25, 2022), para 21.

¹¹¹² *Sh. Ram Bilas Chaudhary vs Sh. Ram Surat Chaudhary*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/77769903/> (last visited May 25, 2022) para 13.

¹¹¹³ *Dilip Kataria vs Neelam Singh*, (last visited May 25, 2022) para 12.45 <https://indiankanoon.org/doc/131133805/> (last visited May 25, 2022) para 13.

and court pointed out that such report could be result of the expert simply deposing in favour of the party that has called him to the court.¹¹¹⁴ The term ‘interest witness’ has also been used for a private expert. The courts were apprehensive that since the expert was paid for providing his services by a particular litigating party, it is highly likely that the expert would depose favourable. Or, the parties would call only that expert to court who comes up with a report that favours them. The court also took note of the possibility of biased opinions when a private expert is being hired by a party to the litigation.

- “It is obvious that a private handwriting expert shall give the report favouring to the party hiring him.”¹¹¹⁵
- “Lastly, the handwriting experts CW-4 and DW-3 examined by both parties to prove their respective reports Ex. CW-4/1 and Ex. DW-3/A does not inspire the confidence of this court being conducted by private experts and the possibility of their report being made to favour their party cannot be ruled out. The two reports appear to be made with vested interest and being a private document is not reliable in view of contradictory stands taken by accused herein.”¹¹¹⁶
- “In the opinion of the court much weightage couldn’t be given by to opinion of handwriting expert as she was engaged by the defendant and was a interested witness.”¹¹¹⁷
- “Firstly, there is no admitted digit “8” with which the expert could have made comparison. Secondly, the reliance of expert on different colour is basically immaterial. Not only there is no material to establish that digit “8” was written in different colour but also the same could not have been ascertained by the expert through photograph (original cheque was not available with the expert).

¹¹¹⁴ *Title Yogender Prasad vs . Anuj Kumar*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/187999545/> (last visited May 25, 2022) para 11.

¹¹¹⁵ *Dilip Kataria vs Neelam Singh*, (last visited May 25, 2022) para 12.45 <https://indiankanoon.org/doc/131133805/> (last visited May 25, 2022) para 13.

¹¹¹⁶ *Vijay Kumar v. Swaraj Gupta*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/4327702/> (last visited May 25, 2022) para 35.

¹¹¹⁷ *Sh. Santosh Kumar vs Also At on 27 January, 2020*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/191778478/> (last visited May 25, 2022) para 19.

Clearly the expert has given his opinion in favour of the person who has engaged him and could not show the integrity of profession.”¹¹¹⁸

On the contrary, it was observed that the courts have expressed more confidence in the report of an expert associated with government laboratory in comparison to privately hired experts. The expert belonging to government laboratory are relied on with less suspicion. The court has held that the probability of such an expert deposing falsely is less. Afterall, all human beings are fallible and an government expert also may depose falsely on being gratified. Yet, the court considered it less likely. The rationale for this approach could be the fact that government experts are not directly paid for testifying in court.

- “It will also be not out of place to mention here that PW15 Dr. S. Ahmad is from Forensic Science Laboratory which is a government body and thus the probability of Dr. S. Ahmad being biased and favourable towards prosecution and inimical against the accused is remote.”¹¹¹⁹

However, there is no binding rule that testimony of a private expert shall always be look at with suspicion. In one of the judgments, the court held that there cannot be unimpeachable assumption that all party hired expert are not worthy of being considered by the court.¹¹²⁰ The court may exercise precaution and care while examining the expert report. Moreover, the report is not binding on the court. After due deliberation the court may decide to accord any amount of weight to the handwriting evidence. The court shall neither outrightly reject nor entirely adhere to the report. Again, the weight assigned to the evidence shall be a factual decision and not be restricted by application of a rigid rule against reliance on private expert.

- “Again, regarding the submission that the expert was hired by the defendant only, it is to observe that whenever a private expert is being examined,

¹¹¹⁸ *Title Yogender Prasad vs . Anuj Kumar*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/187999545/> (last visited May 25, 2022) para 11.

¹¹¹⁹ *State v. Kundan Lal*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/82027289/> (last visited May 25, 2022) para 52.

¹¹²⁰ *Mahadev Prasad Sharma vs . Sanjeev Kumar Jain*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/45203465/> (last visited May 25, 2022) para 14.

undoubtedly, same has to be hired or engaged by the party concerned and only on this ground, it cannot be concluded that the report of handwriting expert is bound to be favourable to the concerned party. Moreover, the court is deemed to be the expert of the experts and in no eventuality is bound by the report of handwriting expert. The said report has to be seen with due caution.”¹¹²¹

Of all the cases that were reviewed, in one case a private expert deposed against the interest of the party that hired him.¹¹²² But the instances where the Forensic Lab deposed in favour of the accused were numerous.¹¹²³ This goes to show that there is no certainty that a private expert would give a favourable report. Also, there were instances when the Forensic Science Laboratory could not give a definite opinion.¹¹²⁴ Thus, it is not imperative that experts from government laboratories would favour the prosecution case. The courts shall be wary of the possibility of bias though no peremptory rule can be laid down.

“However, the FSL report dated 21.05.2016 does not say categorically that the suicide note was written by none other than the deceased. As per the FSL report, the questioned writing and signature and the standard writing and signatures could have been written by one and the same person. It means that even the expert at the FSL were not sure that suicide note was in the handwriting of deceased.”¹¹²⁵

¹¹²¹ *Mahadev Prasad Sharma vs . Sanjeev Kumar Jain*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/45203465/> (last visited May 25, 2022) para 14.

¹¹²² *Sh. Rajesh Kumar Sharma vs Sh. Rajender Sharma*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/194619042/> (last visited May 25, 2022).

¹¹²³ *Mr. Krishan Mann vs The State*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/140061922/> (last visited May 25, 2022); *State vs . Rajbir Singh*, 2019, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/18236339/> (last visited May 25, 2022); *State vs . Santosh Rai*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/140114215/> (last visited May 25, 2022); *Cbi vs . Banwari Lal Etc. ,* ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/191818189/> (last visited May 25, 2022); *State vs . Bankim Chandu Lal Modi & Ors*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/26095872/> (last visited May 25, 2022).

¹¹²⁴ *Mohd. Saleem vs Asi Tej Ram ,* ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/188663486/> (last visited May 25, 2022); *State v. Fahimuddin*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/188663486/> (last visited May 25, 2022).

¹¹²⁵ *State vs J. P. Singh*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/40410042/> (last visited May 25, 2022) para 16.

4.5.2 INFERENCE REGARDING APPRECIATION OF HANDWRITING EVIDENCE IN LOWER COURTS

Handwriting identification has a special place in the Indian Evidence Act. As per the Indian Evidence Act, the identification of handwriting can be carried out not just by an expert but also by anyone familiar with the questioned handwriting or even the judge himself. The analysis of the lower court judgments revealed that the handwriting evidence is mostly considered weak and fragile evidence that shall not be acted on solely. But the courts have carved out an exception to this rule of prudence. In exceptional circumstances, the courts may act solely on the basis of handwriting evidence. In case of these exceptional circumstances, where the reliance is placed on handwriting evidence exclusively, the court ought to be aware of the element of subjectivity inherent in handwriting examination and the possibility of erroneous conclusions. In fact, the courts are frequently presented with divergent opinions by two opposing experts.¹¹²⁶ This very well exemplifies the scope for subjectivity and manipulation in handwriting examinations. The courts have time and again held that private experts hired by parties tend to give opinions that are favourable to their clients.¹¹²⁷ Yet, the courts failed to appreciate that the danger of expert's opinion being biased is very much present even in cases where only one of the parties presents expert evidence in court. The fact that there is no expert evidence from the opposite side does not eliminate the possibility of expert opinion being biased. Further, the limitations associated with handwriting evidence, such as subjective comparison, possible of errors, nearly perfect imitation, etc are never expressly discussed in the judgments.

4.6 BALLISTIC EVIDENCE

Ballistic evidence involves matching the casings of the bullet found at the crime scene with a firearm.¹¹²⁸ The two main purposes of ballistic evidence in courts are: firstly, to check if the questioned gun is in working condition, and secondly, to find out if the questioned gun was used to fire the bullet found at the scene of the crime.¹¹²⁹ A ballistic report that connects a bullet to a particular pistol/gun is considered as a 'good

¹¹²⁶ See section 4.5.1.3.

¹¹²⁷ See section 4.5.1.4.

¹¹²⁸ *The History of Forensic Ballistics – Ballistic Fingerprinting*, INCOGNITO FORENSIC FOUNDATION, <https://ifflab.org/the-history-of-forensic-ballistics-ballistic-fingerprinting/> (last visited on May 26, 2020).

¹¹²⁹ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,7 (2021).

evidence'.¹¹³⁰ The High Court of Delhi, in the case of *Mukesh v. State*,¹¹³¹ has held that bore of a firearm imprints striation marks on a bullet when it is fired. These marks are distinctive and specific to a gun/pistol.¹¹³² "These distinctive marks connect a bullet to a one and only firearm in the world."¹¹³³ And, for this reason ballistic evidence is considered as highly reliable evidence. The Supreme Court of India also considers ballistic evidence as valuable and worthy evidence.¹¹³⁴

The very foundation of the ballistic evidence, i.e. marks left by a gun on a bullet are unique, is not well established.¹¹³⁵ These markings are not permanent and may change owing to wear and tear.¹¹³⁶ Also, with the advancement of manufacturing technique, the uniqueness of markings cannot be presumed.¹¹³⁷ The moulding and casting of firearm are no long done with hand manually.¹¹³⁸ Resultantly, uniqueness of mark on barrel of a gun cannot be presumed.¹¹³⁹ Therefore, it would be erroneous to hold that marks left on a bullet are distinctive and unique as has been held in above-mentioned judgment of the Delhi High Court.

Just like some of the other forensic technique, ballistic evidence is also not scientifically supportable in the absence of validation studies.¹¹⁴⁰ The technique has been generally accepted among the forensic community without detailed examination of the underlying methodology as there has never been a meaningful challenge to its use as a forensic technique.¹¹⁴¹ Further, there has not been a systematic study of verify if the marks made by a gun are unique or not.¹¹⁴² Ballistic evidence has same limitations associated with it as other techniques discussed in the previous section such as handwriting, voice

¹¹³⁰ *Mukesh v. State*, 2009 SCC OnLine Del 2696, para 26.

¹¹³¹ *Ibid.*

¹¹³² *Ibid.*

¹¹³³ *Ibid.*

¹¹³⁴ *Leela Ram v. State of Haryana*, (1999) 9 SCC 525, para 16.

¹¹³⁵ Griffin, Joan, and David J. LaMagna. *Daubert challenges to forensic evidence: Ballistics next on the firing line*, THE CHAMPION 20 (2002).

¹¹³⁶ *Id.*, at 20.

¹¹³⁷ *Ibid.*

¹¹³⁸ *Ibid.*

¹¹³⁹ *Ibid.*

¹¹⁴⁰ *Id.* at 60.

¹¹⁴¹ *Ibid.*

¹¹⁴² *Ibid.*

identification etc. Ballistics are highly subjective.¹¹⁴³ Scientific research is required to ascertain the uniqueness or the probability of uniqueness of marks of firearms.¹¹⁴⁴

4.6.1 REVIEW OF LOWER COURT JUDGMENTS ON BALLISTIC EVIDENCE

A total of 123 cases relating to ballistic evidence were analysed. As mentioned above, there are two purposes of a ballistic expert evidence. One is to determine whether the gun in question was a fire arm in working condition. There were numerous cases where the testimony of the ballistic expert was limited to stating that the gun in question is a fire arm as the definition of the Arms Act and that it is in working condition.¹¹⁴⁵ This category of testimonies has not been challenged in this study as they mere state the condition of the gun as working or non-working.

4.6.1.1 Marks on the bullet are considered Individual characteristics

The other category of ballistic expert testimony related to connecting bullet found at the crime scene with a particular pistol.¹¹⁴⁶ One such testimony has been provided below for illustration purpose.

- “Ld. Prosecutor has drawn my attention to the evidence of ballistic expert PW35 Sh. Puneet Puri, Assistant Director FSL wherein he has deposed that the individual characteristics of firing pin marks present on evidence cartridge case Ex.EC1 and test fired cartridge cases marked TC1 and TC2 (i.e. the

¹¹⁴³ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 153 (2009).

¹¹⁴⁴ National Research Council, *Ballistic Imaging*. Washington, DC: The National Academies Press, 3 (2008).

¹¹⁴⁵ *State vs Rahul*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/53102651/> (last visited May 27, 2022); *State vs Dinesh*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/28202902/> (last visited May 27, 2022); *State vs Aas Mohd.*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/47776309/> (last visited May 27, 2022); *State vs Satish*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/26983665/> (last visited May 27, 2022); *State vs Vishnu Dutt*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/79307620/> (last visited May 27, 2022).

¹¹⁴⁶ *State Vs. Mukesh*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/146546115/> (last visited May 27, 2022); *State vs Jagmohan*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/75799790/> (last visited May 27, 2022); *State Vs Vikas @ Tittu & Others*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/105688262/> (last visited May 27, 2022); *State vs 1. Mukesh @ Bittu*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/33146582/> (last visited May 27, 2022).

cartridge cases of the test fired bullet A1 and A2 allegedly recovered from the magazine of improvised pistol Ex. F1) were found identical when examined under comparison microscope.”¹¹⁴⁷

It shall be noted that the terms such as ‘individual characteristics’ and ‘identical’ have been used in the testimony quoted above. Use of such terminology indicating high degree of certainty and uniqueness is not scientifically supportable. These terms reinforce the erroneous perception that marks left by a gun on a bullet are unique and tend to mislead the court. In the absence of scientific proof of uniqueness, it would have been prudent to use milder terms such as ‘probable’. There have been instances where the ballistic report was presented as a ‘probable’ match.¹¹⁴⁸

Even the manner in which the conclusions drawn by judges have been worded indicate that judges also hold the same misconceived notion.¹¹⁴⁹ Unmindful of the dearth of scientific studies, the court has based on common experience declared that it is impossible that the marks of a gun can match with marks of another gun.¹¹⁵⁰ The review of judgments revealed that judges consider ballistic evidence to be highly reliable. A relevant passage from one of the judgments that highlights the confidence the judges have in ballistic evidence is:

- “It is common experience that lands and grooves and striation pattern of any arms and ammunition cannot match with other one under any circumstance.”¹¹⁵¹
- “Further testimony of PW2 and PW22 also corroborates the story of the prosecution that the country made katta recovered at the instance of accused Neeraj @ Ganja is the same which was used for commission of offence since PW22 in his testimony has deposed that the bullet marked Ex. EB1 was

¹¹⁴⁷ *State vs Ashish*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/158575681/> (last visited May 27, 2022), para 58.

¹¹⁴⁸ *K.Ramaraj v. State*, ‘Madras High Court’ (Indian Kanoon), <https://indiankanoon.org/doc/181432155/> (last visited Dec. 15, 2022), para 46.

¹¹⁴⁹ *State vs Ravinder*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/193729229/> (last visited May 27, 2022), para 61.

¹¹⁵⁰ *State vs Nikhil Rana*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/44235950/> (last visited May 27, 2022), para 117.

¹¹⁵¹ *State vs Nikhil Rana*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/44235950/> (last visited May 27, 2022), para 117.

corresponding to the bullet of 8 mm/.315 inch cartridge and had been discharged through the country made pistol marked Ex. F1 as the individual characteristics of striations present on evidence bullet marked Ex. EB1. The deposition of PW22 being an expert opinion cannot be discarded and he is an independent witness and there is no reason with him to give a false report.”¹¹⁵²

The 2003 judgment of Delhi High, i.e., *Mukesh v. State*,¹¹⁵³ has been quoted with approval by lower court.¹¹⁵⁴ This judgment has held that striation marks are individual characteristics of a gun which is not a scientifically proved fact. Unfortunately, adherence to doctrine of precedents has led the lower courts also to hold this believe without doubt and scientific enquiry.

Also, in one case, the judge seems to have confused scientific reliability with “validity as applied”.¹¹⁵⁵ In this case, the court quoted the testimony of the ballistic expert that related to the comparison of bullets marks and factual application of ballistics.¹¹⁵⁶ Right after the testimony, the court concluded that the report is based on well-found reason and scientific principles. The scientific principles and parameters were not found in the discussion. This is could have been the result of generally held perception that ballistic marks are unique and that is a scientifically established fact.

4.6.1.2 Considered as Corroborative

Yet, the courts have held that a case cannot be decided solely on the basis of only ballistic evidence as it does not complete the chain of events. For instance, ballistic evidence may be helpful in proving that a particular was used from committing the offence. But in order to prove that a particular person fired the shot from that gun would need to be proved with the help of some other evidence.

¹¹⁵² *State vs Ravinder*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/193729229/> (last visited May 27, 2022), para 61.

¹¹⁵³ *Ibid.*

¹¹⁵⁴ *State vs Ashok*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/138528660/> (last visited May 27, 2022), Para 104.

¹¹⁵⁵ *State vs Shadab*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/157597208/> (last visited May 27, 2022).

¹¹⁵⁶ *Id.* para 63.

In another instance, the court ignored the ballistic evidence holding that it is only corroborative.¹¹⁵⁷ It is pertinent to note that, in this case, a generic reason was assigned for considered ballistic evidence as corroborative i.e. these are opinion evidences. Such reasoning does not hold water as even opinion evidences as worth relying on completely if the technique involved is reliable. For example, DNA evidence is also opinion evidence but the reliability of the DNA technology has made it completely reliable evidence. It would have been more appropriate to hold that scientific studies do not support complete reliance on ballistic evidence and, therefore, it shall be considered as secondary evidence. Some of the relevant excerpts are:

- “In the absence ¹¹⁵⁸of testimony of eye witnesses, other circumstantial evidence i.e., FSL result Ex PW-40/A, Ballistic Expert report Ex PW-38/A and CDR of accused persons are not such piece of evidence which make chain so complete as to point out towards guilt of the accused persons in all human probability.”¹¹⁵⁹
- “Before evaluating the credibility of ocular evidence vis-a- vis ballistic evidence, which has come on record in the instant case, let us first discuss the legal position in this regard. Although, the medical and scientific evidences in current scenario of scientific developments do play an important role in criminal trials for proving the guilt, but these are only corroborative piece of evidence and often inconclusive in nature because it is primarily evidence of opinion and not of fact. The testimony of an eye witness, therefore, cannot be thrown out merely on the ground of inconsistency with the scientific evidence which is only probative and corroborative.”¹¹⁶⁰

In few of the judgments, especially where country made pistol is involved, the experts could not give a definite opinion due to absence of distinguishable marks as the

¹¹⁵⁷ *State vs Praveen*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/13176462/> (last visited May 27, 2022), para 102.

¹¹⁵⁸ *State vs Nikhil Rana*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/44235950/> (last visited May 27, 2022), para 117.

¹¹⁵⁹ *State vs Bhushan*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/99806325/> (last visited May 27, 2022), para 110.

¹¹⁶⁰ *State vs Praveen*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/13176462/> (last visited May 27, 2022), para 102.

percussion cap had blown off.¹¹⁶¹ In certain judgments the forensic lab deposed that the recovered bullet was not fired from the gun in question.¹¹⁶² These judgments do not provide any useful information that could be part of the present discussion.

4.6.2 INFERENCE REGARDING APPRECIATION OF BALLISTIC EVIDENCE IN LOWER COURTS

The finding of the review of cases involving ballistic evidence is similar to the inferences drawn in relation to other forensic techniques. The judgments are devoid of discussion on the subjective nature of ballistics or the scope for errors. The expert reports presented in the courts use terms such as ‘identical’ in cases where they find a match. The admissibility of the technique appears to have been historically determined and is not considered a debatable issue anymore. In the absence of any discussion about the limitations of the technique or any scientific literature, there remains a serious danger of judges assigning high probative value to ballistic evidence.¹¹⁶³ Such decisions relating to how much weight has been assigned to particular evidence is never discussed in judgments. Thus, there is no way to check if an undue reliance has been placed on particular evidence. The discussion relating to the nature and credibility of a forensic technique in judgments may point toward the extent to which the court considered it reliable. From the discussion relating to ballistics in the cases reviewed, it appears that the courts are unaware of the limitation of ballistics as a forensic technique. The extent to which a judge seeks corroboration also depends on the perception of the judge about the credibility of the technique. Thus, it is essential that a judge accurately understands and appreciates the reliability of ballistic evidence.

4.7 OTHER RELEVANT OBSERVATIONS

Apart from the techniques discussed above, some of the other forensic techniques referred to in the judgments are serology, mobile tracking, food analysis, wildlife, blood, bone ossification, age, CCTV, chemical, architecture, cyber, drug analysis, GEQD, post mortem, serology, mechanics etc. The number of cases relating to these techniques are 736. The detailed bifurcation has been provided in table 6.2. Five judgments pertaining

¹¹⁶¹ *State vs Sameer*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/23914793/> (last visited May 27, 2022), para 38.

¹¹⁶² *State vs Devender*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/166920139/> (last visited May 27, 2022), para 11.

¹¹⁶³ See section 6.6.1.1

to these techniques that are relevant to the present research have been discussed in this section. The issue of partisanship among privately hired experts was discussed in the case of *C.B.I v. Subhash Chandra*.¹¹⁶⁴ The court, in the judgment, mentioned that the handwriting experts that are hired and remunerated by the parties to the litigation have a tendency to give reports that favour the interest of the party.¹¹⁶⁵ As a result, much reliance cannot be attached to the report or testimony of such expert witnesses.¹¹⁶⁶ In a judgment involving the examination of an architecture expert, the court held that:

- “There is special difficulty in dealing with the evidence of expert witnesses. Such evidence must always be received with caution, they are too often partisans, that is they are reluctant to speak quite the whole truth, if the whole truth will tell against the party who had paid them to give evidence.”¹¹⁶⁷

Further, there were judgments illustrating that judges tend to rely on legal precedents in order to decide scientific issues. Such as, in the case of *Basant Gupta v. State*, the court relied on past judicial pronouncements to decide the reliability of radiological examination for age determination.¹¹⁶⁸ Likewise, in the case of *Delhi Administration v. Kewal Krishan Gautam*, the court relied on legal precedents to decide the issue of degeneration of food samples with the passage of time.¹¹⁶⁹

Of all the judgments that were reviewed for the purpose of this study, *Daubert* standards were discussed in only one judgment, i.e., *NCB v. Jagbir*.¹¹⁷⁰ The case involved the testimony of a chemical expert. The judge in the case acknowledged that *Daubert* standards are internationally accepted standards.¹¹⁷¹ Though, the judge merely reiterated the standards without actually applying it to the case. Thus, in effect, the application of *Daubert* is entirely missing from the judgments of the lower courts. Yet, this single

¹¹⁶⁴ *CBI v. Subhash Chandra*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/79982667/> (last visited May 31, 2022), para 172.

¹¹⁶⁵ *Ibid.*

¹¹⁶⁶ *Ibid.*

¹¹⁶⁷ *Sh. Dev Prakash v. Smt. Usha Sethi*, ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/70026842/> (last visited May 31, 2022), para 8.

¹¹⁶⁸ ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/80343555/> (last visited May 31, 2022).

¹¹⁶⁹ ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/42428474/> (last visited May 31, 2022).

¹¹⁷⁰ ‘Delhi District Court’ (Indian Kanoon), <https://indiankanoon.org/doc/135900510/> (last visited May 31, 2022).

¹¹⁷¹ *Id.* at 59.

judgment referring to *Daubert* is highly significant as it acknowledges the applicability of the standards to the Indian courts.

4.8 CONCLUSION

A technique-based analysis of judgments has yielded similar outcomes. Overall, it may be stated that there was no mention of the limits of forensic evidence, such as the potential of errors or subjectivity, in the judgements. The terminology employed in the expert's reports indicates a high degree of assurance for outcomes that lack scientific basis. Objections to forensic evidence are mostly procedural and have no bearing on the epistemic defects inherent in the use of a forensic approach. Importantly, a technique's reliability is proven with the use of judicial precedents, but scientific literature is seldom cited. Consequently, the most recent scientific advancements are excluded from the debate and interpretation of forensic evidence. Cross-examination and reliance on precedents are the two primary sources for demonstrating the credibility of forensic evidence. Scientific literature, the most pertinent and direct source of scientific information, is seldom cited. Similar patterns were observed in random analysis of judgments of other states in India.¹¹⁷²

This gap in the legal system exemplifies how unconnected the worlds of scientific inquiry and law are. The underlying reality is that forensic evidence is not always interpreted in light of scientific research to evaluate its reliability. This is a serious issue that necessitates a complete overhaul of the evidentiary system governing expert testimony. Just as science advances and evolves with time, the legal system shall do the same.¹¹⁷³

Several important conclusions have been derived from the examination of the rulings made by the trial courts. However, it is conceivable that these judgments may lack certain cognitive and judicial deliberations carried out by a judge during the process of

¹¹⁷² *Sri. L. Krishna Prasad vs Smt. Ashwathamma*, Delhi District Court' (Indian Kanoon), <https://indiankanoon.org/doc/26587957/> (last visited June 1, 2022); *Smt. Lalitha Bai.K vs Sri. Chandrashekar*, Delhi District Court' (Indian Kanoon), <https://indiankanoon.org/doc/172032154/> (last visited May 31, 2022); *State of Mahalakshmi Layout Police, Bangaluru City v. Chandrashekar*, Delhi District Court' (Indian Kanoon), <https://indiankanoon.org/doc/116347561/> (last visited May 31, 2022).

¹¹⁷³ AA Moenssens and SB Meagher, *FINGERPRINT SOURCEBOOK*, ch. 13 (2011).

making a judicial decision. These limitations can be overcome by adopting a more straightforward approach, namely by directly engaging in conversation with the judges. The subsequent two chapters will offer a direct understanding of the matter under consideration. These chapters deal with the findings drawn from interviews with the judges.

5.0 ANALYSIS OF JUDGE'S EXPERIENCE WITH ASSESSMENT OF FORENSIC EVIDENCE

Judges and lawyers usually react to science with all the enthusiasm of a child about to get a tetanus shot. They know it's painful and believe it's necessary but haven't the foggiest idea how or why it works. - Bert Black¹¹⁷⁴

5.1 INTRODUCTION

Making accurate admissibility decisions is a primary responsibility of judges.¹¹⁷⁵ Judges face a peculiar challenge when it comes to analysing scientific evidence, as opposed to other sorts of evidence.¹¹⁷⁶ The ability of a judge to effectively evaluate forensic evidence has been questioned on many occasions.¹¹⁷⁷ There have been discussions and debates on issues, such as, is the evaluation of forensic evidence by judges adequately supported and guided by judges' knowledge and experience; are various sorts of scientific evidence dealt with by judges in different ways; how do judges determine the reliability of forensic evidence, etc. A proper understanding of these issues can be developed by seeking the views of judges themselves on the issue of assessment of forensic evidence and their evaluation practices.¹¹⁷⁸ Yet, judges are seldom questioned about their thoughts, perceptions, and views. There have been only a few studies that present empirical findings on the perception of judges.¹¹⁷⁹ None of these studies relates to Indian judges or their experiences. As a consequence, very little is known about the evaluative processes and tools employed by judges in making evidentiary decisions.

¹¹⁷⁴ B. Black, *Science and the Law at the Wake of Daubert: A New Search for Scientific knowledge*, (72) TEX. L. REV. 715,716-17 (1994).

¹¹⁷⁵ Gatowski, S.I., Dobbin, S.A., Richardson, J.T., Ginsburg, G.P., Merlino, M.L. and Dahir, V., *Asking the gatekeepers: A national survey of judges on judging expert evidence in a post-Daubert world.*, 25(5) LAW AND HUMAN BEHAVIOR 433, 434 (2001).

¹¹⁷⁶ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, (22) CRIMINOLOGY, CRIM. Just. L & Soc'y 1,2 (2021).

¹¹⁷⁷ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 100 (2009).

¹¹⁷⁸ *Id.*

¹¹⁷⁹ Gatowski, S.I., Dobbin, S.A., Richardson, J.T., Ginsburg, G.P., Merlino, M.L. and Dahir, V., *Asking the gatekeepers: A national survey of judges on judging expert evidence in a post-Daubert world.*, 25(5) LAW AND HUMAN BEHAVIOR 433 (2001); Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, (22) CRIMINOLOGY, CRIM. Just. L & Soc'y 1 (2021); and Canella, C. and others, M., *How do legal experts cope with medical reports and forensic evidence? The experiences, perceptions, and narratives of Swiss judges and other legal experts*, 10 (18) FRONTIERS IN PSYCHIATRY 1 (2019).

The present study is an attempt to fill this gap. This chapter presents the results of a survey conducted with judges from district courts in New Delhi (N=20) by way of interviews. Detailed information regarding the methodology used for the purpose of the survey is provided in chapter 2. The primary aim of the chapter is to answer the research question: how do the courts in India assess the reliability of a particular forensic technique? To adequately answer the question, the survey study touches upon issues such as Judges' opinions on the reliability of certain commonly used forensic techniques, tools/methods used to evaluate the reliability of expert evidence, the use of a court-appointed expert, etc. For the sake of orderly presentation, the findings of the survey study have been divided into two chapters (chapters 5 and 6).

5.2 SURVEY RESULTS

The survey findings were analysed thematically, as discussed in section 2.4 of the chapter 2. The analysis revealed the following themes: commonly used forensic techniques, need for corroboration, reluctance to use court-appointed experts, lack of training, acknowledgment of gatekeeping function, methods employed to assess the reliability of forensic techniques, reliance on heuristics; and *Daubert*- an unknown entity. To present the analysis of the themes in an organised manner, the first four themes have been discussed in this chapter. And the remaining four themes shall be covered in the next chapter.

5.3 COMMONLY USED FORENSIC TECHNIQUES

With the aim of finding out the spectrum of forensic techniques that the participants of the study dealt with, one of the preliminary questions that were asked to the judges was: what kind of forensic evidence do you usually deal with. As per the responses given by the participants, the following chart presents the types of forensic evidence and the number of judges that had the experience of appreciating that category of evidence.

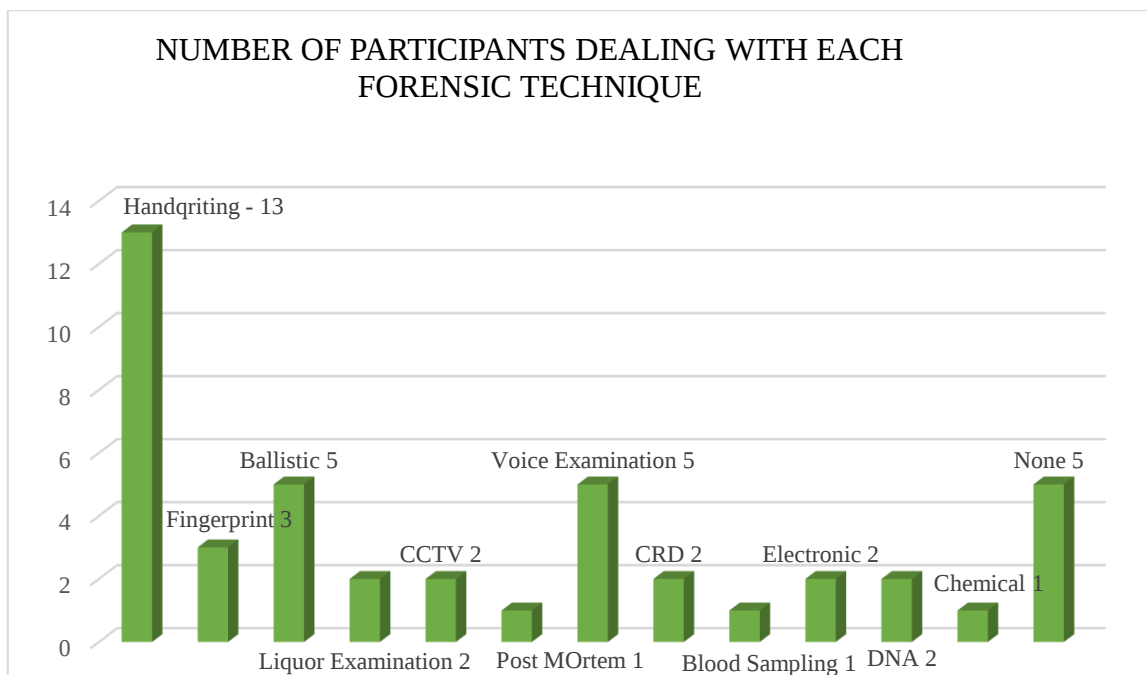


Figure 5-0-1

Handwriting expert evidence was found to be the most commonly used. Five participants had experience with an appreciation of ballistic expert evidence and voice examination. Three judges had the experience of appreciating fingerprint evidence. Only two of the 20 participants (P6 and P8) had dealt with DNA evidence. Five participants (P7, P11, P14, P17 and P19) had not dealt with forensic evidence as they had newly joined the judicial services.

On being asked about new forms of expert evidence produced before the court, few judges mentioned evidence relating to CDR (call detail record) and CCTV (Closed-circuit television). One of the judges mentioned the use of CCTV footing in the case of *Ajmal Kasab*.¹¹⁸⁰ One of the judges mentioned that he had heard of forensic audit reports being presented in court, though he had no personal experience with this kind of evidence. A forensic audit refers to an examination of financial records and transactions of a company for legal purposes, such as the investigation of fraud or misappropriation of funds. In the case of *Bikram Chatterji v. Union of India*¹¹⁸¹, the Supreme Court decided the issue of fraud by a real estate company with the help of forensic auditors. P3 mentioned gait as a technique that is being introduced in courts as evidence lately.

¹¹⁸⁰ *Mohd. Ajmal Amir Kasab v. State of Maharashtra*, (2012) 9 SCC 1.

¹¹⁸¹ (2020) 16 SCC 356.

Gait as a forensic technique is so new to the courts that some judges had no idea what this technique was all about. Gait refers to the analysis and evaluation of a person's locomotion, i.e., their style of walking.¹¹⁸² The purpose behind asking these questions was to gain knowledge of the kind of technology the participants had the chance to evaluate. Such information would determine the extent to which the findings of the survey would be significant. If the participants of the study had the experience of assessing only traditional and limited forensic techniques, their experience and perspective were bound to be equally limited. However, it was found that the participant had the opportunity to evaluate a wide variety of forensic evidence cumulatively. In total, twelve different types of forensic evidence were mentioned by the participants, as shown in the chart above.

Forensic science is progressing rapidly, and it is critical that the law keeps up with it.¹¹⁸³ Last few decades have witnessed tremendous growth in the field in which evidence is produced in courts. Forensic science is a broad term that encompasses a wide range of scientific disciplines. There is no doubt that the techniques used as part of forensic science have been influenced by many different branches of pure sciences in the past, such as medicine and chemistry, but in recent years, the field has developed its own branches and are applied for forensic purposes exclusively.¹¹⁸⁴ Thus, a wide range of forensic evidence may be presented in courts. As a consequence, judges have to analyse a broad array of forensic evidence as gatekeepers. Strange as it may seem, in 2018 in the case of *Kumari Chandra v. State*,¹¹⁸⁵ Rajasthan High Court was presented with expert evidence concerning a medical condition called PMS (Premenstrual Stress Syndrome). The court had to determine if PMS could lead to psychological unsoundness.

5.4 NEED FOR CORROBORATION OF FORENSIC EVIDENCE

The study seeks to ascertain the legal principles and rules employed by judges in evidence evaluating process. The aim is to find out if there are some principles, guidelines, or standards similar to the *Daubert* standards that govern the evaluation of forensic evidence. As mentioned earlier, the survey instrument and the analysis of the

¹¹⁸² Badiye, Ashish, Prachi Kathane, and Kewal Krishan, *Forensic Gait Analysis*, (2020) <https://www.ncbi.nlm.nih.gov/books/NBK557684/> (last visited Feb. 24th, 2022).

¹¹⁸³ *State v. S.J. Choudhary*, (1990) 2 SCC 481.

¹¹⁸⁴ Justice Jitendra N. Bhatt, *A Profile of Forensic Science in Juristic Journey*, (2003) 8 SCC J-25.

¹¹⁸⁵ *Indian Kanoon*, <https://indiankanoon.org/doc/197692173/> (last visited Oct. 14th, 2022).

survey findings have been done based on the themes that emerged from the literature review. The two principles in relation to the evaluation of forensic evidence that emerged from the literature and legal precedents are: the rule of prudence requiring corroboration of forensic evidence and the practice of considering forensic evidence as secondary to ocular evidence. The following is the discussion on survey results pertaining to these two well-established principles.

5.4.1 RULE OF PRUDENCE REQUIRING CORROBORATION

As noted in Chapter 3, Section 3.2.1.2, in general, expert evidence is not acted on solely/exclusively as a matter of caution. The court must seek corroboration of expert testimony as expert testimony is only an opinion.¹¹⁸⁶ Corroboration means "other evidence which supports the evidence of the single witness and which detracts from the evidence of the accused and renders it less probable with regard to one or more of the issues in dispute".¹¹⁸⁷ However, the application of the rule to seek corroboration is not rigid. If the expert testimony relates to a technique that is exact science, such as DNA technology, the court may waive the requirement of corroboration and determine the case solely on the basis of the expert evidence. Thus, whether or not the court will seek corroboration is a question of fact and context. The Supreme Court, in the case of *Murari Lal v. State of Madhya Pradesh*,¹¹⁸⁸ emphasised that seeking corroboration is merely a rule of caution and is not a legal rule. That means that there is no mandatory requirement of law to look for corroboration of expert evidence. In short, the court shall be cautious and adaptable while assessing the probative worth of forensic evidence.¹¹⁸⁹

In case of DNA and other extremely reliable forensic techniques, a conviction may be based solely on forensic evidence. Similarly, in the United States, a person may be convicted only on a single piece of evidence without being corroborated with the help of other evidence.¹¹⁹⁰ It is believed that a low rate of error is connected with highly

¹¹⁸⁶ *Chennadi Jalapathi Reddy v. Baddam Pratapa Reddy*, (2019) 14 SCC 220; *Ram Chandra and Ram Bharosey v. State of Uttar Pradesh*, AIR 1957 SC 381; *Shashi Kumar Banerjee v. Subodh Kumar Banerjee*, AIR 1964 SC 529; *Magan Bihari Lal v. State of Punjab*, (1977) 2 SCC 210; *S. Gopal Reddy v. State of Andhra Pradesh*, (1996) 4 SCC 596.

¹¹⁸⁷ Adebola Olaborede & Lirieka Meintjes-Van der Walt, *The Dangers of Convictions Based on a Single Piece of Forensic Evidence*, 23 POTCHEFSTROOM ELEC. L.J. 1,3 (2020).

¹¹⁸⁸ 1980 SCR (2) 249, at 257.

¹¹⁸⁹ *Chennadi Jalapathi Reddy v. Baddam Pratapa Reddy*, (2019) 14 SCC 220, para 9.

¹¹⁹⁰ Halpert, Mordeschai, *From a plane crash to the conviction of an innocent person: Why forensic science evidence should be inadmissible unless it has been developed as a safety-critical system*, 32 HAMLINE L. REV. 65 (2009).

developed forensic procedures, which reduces the likelihood of making incorrect conclusions.¹¹⁹¹ *Sangeo*,¹¹⁹² on the other hand, argues that even a low mistake rate might result in wrongful convictions if relied upon completely without corroboration. The author argues that convicting someone only on the basis of a single piece of evidence, regardless of its credibility, is a risky strategy. This danger is a cause of concern for non-expert evidence also, such as confessions and eyewitness testimony.¹¹⁹³

On being enquired about the application of the rule requiring corroboration, 15 judges¹¹⁹⁴ expressed rigidity in the application of the rule. They believed that in all cases corroboration shall be sought. The following were their responses:

- “Yes, we have to look for corroboration. Because experts are also not sure of their findings. They don’t give conclusive reports.” (P3)
- “Generally, do not solely rely on forensic evidence, there are chances of manipulation.” (P4)
- “Judgments cannot be solely based on expert evidence. Expert opinion is only opinion evidence. It does not carry much value.” (P5)
- “Corroboration is required. Ultimate test is reasonability of evidence, totality is seen.” (P8)
- “These are only advisory evidence as they are only “opinions.” (P9)
- “These are only circumstantial evidence.” (P12)
- “Expert evidence are opinion evidence, they cannot be acted on, in an hypothetical situation where there is no other evidence.” (P14)
- “In most cases we look for corroboration, unless there is nothing to contradict the expert report.” (P15)
- “Shall be decided as per the factual situation, there are other evidence that may help in deciding the reliability of expert evidence.” (P16)

Thus, the majority of the judges believed that corroboration shall be sought in support of expert evidence in all cases. The various reasons mentioned in support of the rule

¹¹⁹¹ Boaz Sangero & Mordechai Halpert, *Why a Conviction Should Not be Based on a Single Piece of Evidence: A Proposal for Reform*, 48 JURIMETRICS 43,44 (2007).

¹¹⁹² *Ibid.*

¹¹⁹³ *Id.* at 45.

¹¹⁹⁴ P2, P3, P4, P5, P7, P8, P9, P11, P12, P14, P15, P16, P17, P19 and P20.

are: the inconclusiveness of the expert report, the advisory nature of the expert reports, the need to consider all evidence together, etc. P3 stated that the expert reports are inconclusive as there are merely opinions. P15 opined that the issue of seeking corroboration does not arise in cases where there is no evidence to contradict the expert evidence.

The remaining 5 participants mentioned that corroboration is not always required.¹¹⁹⁵ These participants hinted towards a less strict application of the rule. According to these 7 participants, seeking corroboration of expert evidence is a factual decision, and whether or not corroboration shall be sought is dependent on the factual situation and other evidence present before the court. For instance, P13 illustrated that in cases where the expert evidence relates to evidence of dog tracking, corroboration would be required.

5.4.1.1 DNA

The survey instrument included questions relating to the application of the corroboration rule in relation to specific scientific evidence, such as DNA,¹¹⁹⁶ fingerprints, ballistics, and handwriting. As regards DNA evidence, 11 participants affirmed that in the case of DNA evidence, no corroborating evidence is required.¹¹⁹⁷ They all seemed to have a great deal of faith in the DNA evidence's reliability. The confidence in the performance of DNA evidence can be discerned from the following averments:

- “DNA is very exact.” (P13)
- “DNA is a conclusive proof. It is established science.” (P6)
- “Supreme Courts tells us to treat DNA evidence as direct evidence.” (P7)
- “It is totally reliable. There are case laws to this effect. DNA science is developed.” (P8)
- “If the chain of events is complete, can rely on DNA evidence unless inconclusive.” (P12)

The majority of the participants view DNA as an exact science and as conclusive proof. Supreme Court by holding DNA technique as exact science has set legal precedent for

¹¹⁹⁵ P1, P6, P10, P13 and P18.

¹¹⁹⁶ “The DNA stands for deoxyribonucleic acid, which is the biological blueprint of every life.” *Dharam Deo Yadav v. State of U.P.*, (2014) 5 SCC 509.

¹¹⁹⁷ P6, P7, P8, P9, P10, P12, P13, P14, P15, P18 and P20.

the lower court judges. The judges are bound to follow the legal precedents set by the higher courts.

Other 4 participants stated that they would decide on the issue of corroboration based on the facts of the case.¹¹⁹⁸ For instance, P4 mentioned that the extent of reliance on DNA evidence is dependent on the genuineness of the report and proper execution of the seizure and sampling. P5 stated that the reliability of DNA evidence is dependent on the part of the body from which the sample DNA has been extracted. He opined that if DNA is taken from a hair strand or nails, then the reliability of DNA is low. Thus, these 4 participants admitted that DNA is considered the best evidence, yet in order to base the judgment solely on DNA evidence, the judge should be satisfied as to the execution of sampling, seizure, and preservation of the evidence. The remaining 5 participants candidly admitted that they had no opportunity to appreciate DNA evidence and, therefore, expressed their inability to answer the question.¹¹⁹⁹

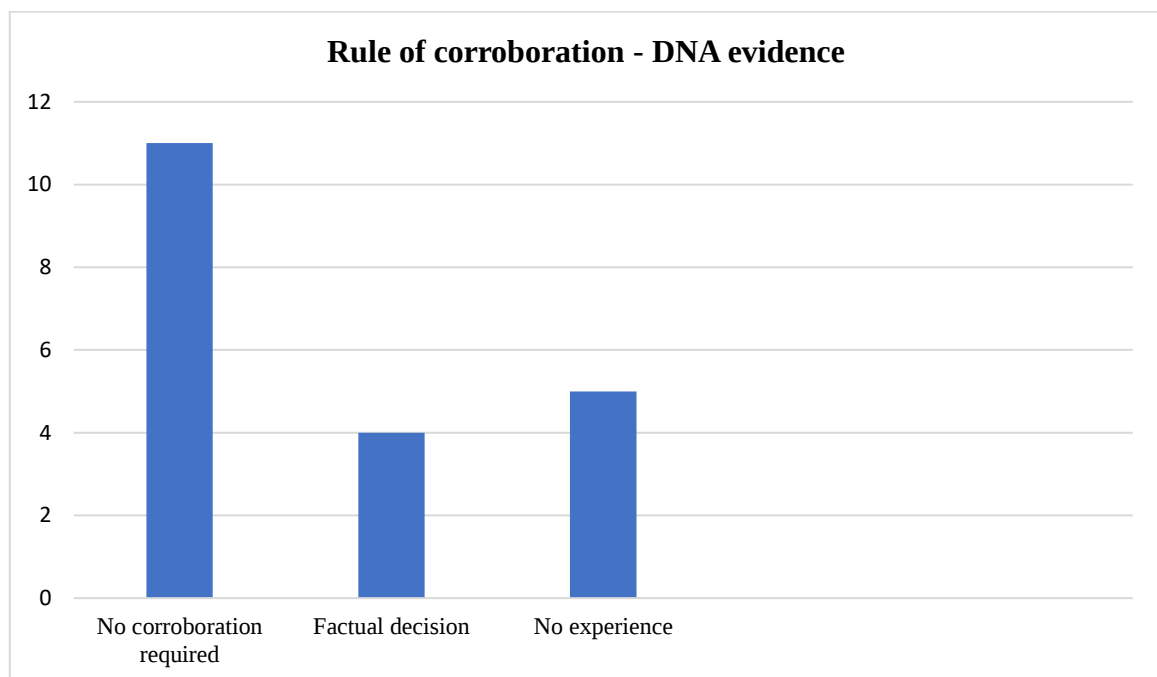


Figure 5-0-2

¹¹⁹⁸ P4, P5, P11 and P16.

¹¹⁹⁹ P1, P2, P3, P17 and P19.

DNA has been in use for about three decades now.¹²⁰⁰ No other branch of forensics has evolved as much as DNA.¹²⁰¹ DNA evidence is compared with gold standards in forensics.¹²⁰² The technique has been carefully studied by the scientific community. Lawyers and judges are consequently bound to have considerable faith in the reliability of DNA evidence.¹²⁰³

Likewise, a majority of the participants of the present study have shown great regard for DNA evidence. The perception of the participants is comparable to the findings of a similar survey study by *Esther Nir & Siyu Liu*.¹²⁰⁴ The participants of that study also perceived DNA evidence as the most reliable and referred to DNA evidence as ‘bulletproof’, ‘rock crusher’, and “the golden child.”¹²⁰⁵ Reliability of DNA evidence has been judicially recognised in numerous judicial precedents.¹²⁰⁶ The Supreme Court of India has gone to the extent of stating that DNA identification is 100 percent precise.¹²⁰⁷ Overall, judges seem to have tremendous faith in the accuracy and reliability of DNA technology.

It is important to understand that the reliability of forensic evidence is not equivalent to the reliability of the forensic technique. Reliability of scientific evidence is contingent upon three factors: the soundness of the fundamental scientific principle involved, the credibility of the method used to apply those scientific principles, and the correct application of the method in a specific case.¹²⁰⁸ Thus, the reliability of DNA evidence would also depend on quality assurance and quality control mechanisms in

¹²⁰⁰ Garrett, Brandon L., and Gregory Mitchell, *Forensics and fallibility: comparing the views of lawyers and jurors*, 119 W. VA. L. REV. 621,624 (2016).

¹²⁰¹ NATIONAL RESEARCH COUNCIL, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE, NATIONAL ACADEMIES PRESS (2011).

¹²⁰² Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council 100,7 (2009); see also Michael Lynch, *God's Signature: DNA Profiling, The New Gold Standard in Forensic Science*, 27 ENDEAVOUR 93 (2003).

¹²⁰³ NAT'L INST. OF JUSTICE & NAT'L INST. OF STANDARDS & TECH., LATENT PRINT EXAMINATION AND HUMAN FACTORS: IMPROVING THE PRACTICE THROUGH A SYSTEMS APPROACH (2012); OFFICE OF THE INSPECTOR GEN., U.S. DEP'T. OF JUSTICE, A REVIEW OF THE FBI'S HANDLING OF THE BRANDON MAYFIELD CASE 1 (2006).

¹²⁰⁴ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,6 (2021).

¹²⁰⁵ *Ibid.*

¹²⁰⁶ *Rohit Shekhar v. Narayan Dutt Tiwari*, 2011 SCC OnLine Del 4076; *Santosh Kumar Singh v. State*, (2010) 9 SCC 747; *Kamti Devi v. Poshi Ram*, (2001) 5 SCC 311.

¹²⁰⁷ *Mukesh v. State (NCT of Delhi)*, (2017) 6 SCC 1, para 91.

¹²⁰⁸ *Rohit Shekhar v. Narayan Dutt Tiwari*, 2011 SCC OnLine Del 4076, para 111.

forensic laboratories, as was rightly pointed out by P4, P11 and P16.¹²⁰⁹ The process of procuring DNA evidence and preservation of samples is controlled by human agency; therefore, the chances of human error cannot be ruled out.¹²¹⁰ Even DNA evidence may lead to erroneous decisions, if the sample of DNA gets contaminated or if there is some error in the handling of the sample.¹²¹¹ DNA testing of a contaminated/compromised sample can give unreliable findings.¹²¹² This is a procedural error and has nothing to do with the inherent reliability of DNA evidence, yet this possibility shall not be lost sight of. The High Court of Bombay has held that, though DNA evidence is conclusive proof of the guilt, the court shall be wary of chances of playing with the sample or tempering.¹²¹³ There have been wrongful convictions because of faulty testing of DNA evidence in laboratories.¹²¹⁴ For these reasons, it is believed that the courts shall not decide a case solely on the basis of DNA evidence without seeking corroboration.¹²¹⁵ Sole reliance on DNA evidence carries with it the danger of wrongful conviction.¹²¹⁶ DNA evidence is infallible only if there are no errors or manipulation in the application of the technique.¹²¹⁷

¹²⁰⁹ *In Reference v. Vinod*, 2018 SCC OnLine MP 466.

¹²¹⁰ *Sri Paramesha vs State of Karnataka*, available at <https://indiankanoon.org/doc/147048662/>.

¹²¹¹ National Research Council, 2011. Reference manual on scientific evidence. National Academies Press.

¹²¹² Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 100 (2009), p 9.

¹²¹³ *Pravin v. State of Maharashtra*, 2019 SCC OnLine Bom 368, para 41.

¹²¹⁴ Garrett, Brandon L., and Gregory Mitchell, *Forensics and fallibility: comparing the views of lawyers and jurors*, 119 W. Va. L. Rev. 633, 634 (2016).

¹²¹⁵ Boaz Sangero, *Safety from Flawed Forensic Sciences Evidence*, 34 Ga. St. U. L. Rev. 1129, 1169 (2018).

¹²¹⁶ *Ibid.*

¹²¹⁷ *State of Gujarat v. Jayantibhai Somabhai*, <https://indiankanoon.org/doc/14257299/> (last visited Mar. 2, 2022).

5.4.1.2 Fingerprint

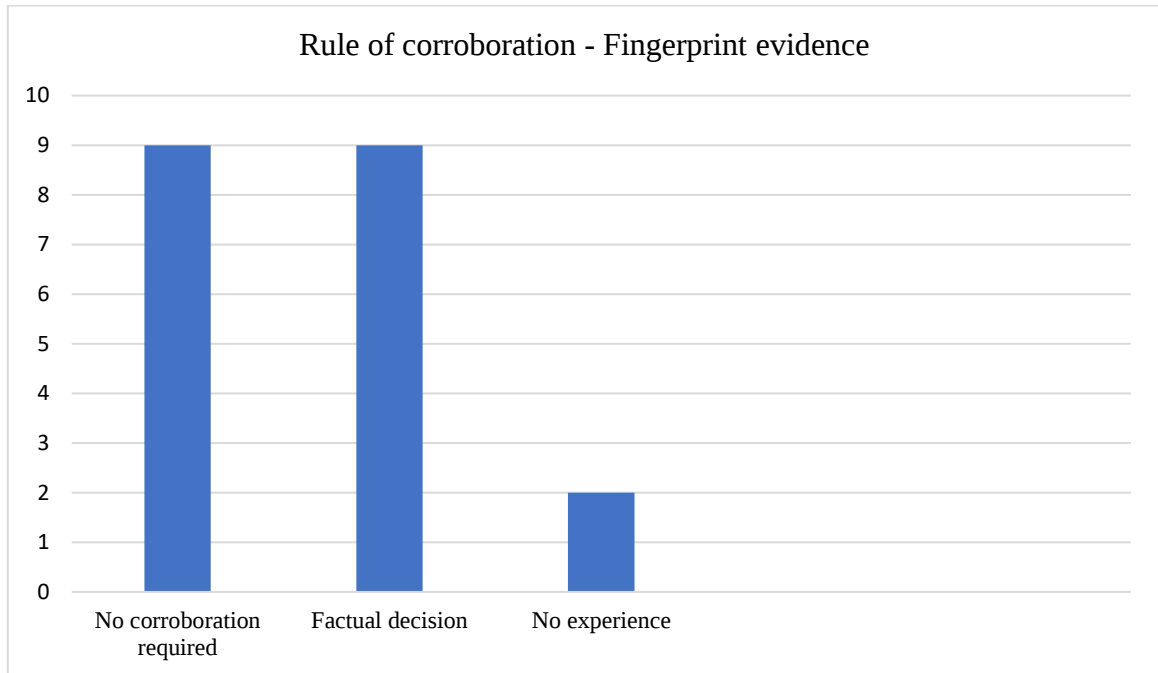


Figure 5-0-3

Regarding fingerprint evidence, the opinions of the participants were equally divided. 9 participants considered fingerprint evidence to be highly reliable and would not look for corroborating evidence.¹²¹⁸ The judges' confidence was evident from the following terms that the judges used:

- "Exact science." (P2)
- "Established science just like post mortem. The question of accuracy never arises." (P3)
- "Fully evolved science. error rate is less – 0.01%." (P12)

An equal number of judges held that the issue of corroboration would be determined by the factual situation.¹²¹⁹ According to them, the weight given to fingerprint evidence is decided by the facts and circumstances of the case. They voiced reservations regarding the appropriateness of collecting and preserving chance prints. For example, P7 stated that though fingerprint evidence is highly reliable, there are chances of error in collection and examination of evidence and, therefore, it cannot be relied on without seeking

¹²¹⁸ P2, P3, P8, P9, P12, P13, P14, P18 and P19.

¹²¹⁹ P1, P4, P5, P7, P10, P11, P15, P16 and P20.

corroboration. Two participants refused to answer this question as they had not dealt with fingerprint evidence.¹²²⁰ None of the participants was familiar with the point system that was once used in the fingerprint identification technique. The point system refers to the number of similarities found between the ridge characteristics of the two prints.¹²²¹

Historically, fingerprint evidence was considered to be trustworthy and error-free. This view of the reliability of fingerprint evidence seems to have shifted in the aftermath of high-profile fingerprinting failures.¹²²² The most notorious case in this regard is the case of *Brandon Mayfield*. He was erroneously arrested for the 2004 explosion in Madrid based solely on latent fingerprint analysis.¹²²³ One of the examiners at the FBI had determined that there was 100% certainty in the fingerprint match.¹²²⁴ The identification was later found to be an erroneous fingerprint comparison.¹²²⁵ As the subjective aspect of the forensic procedure has been exposed, judges' perceptions of fingerprint evidence are rapidly shifting. More emphasis is being placed on the quality of the prints and the procedure's validity.¹²²⁶

Considering fingerprint identification as an accurate science is not valid anymore. The lack of research in the field of fingerprinting as a discipline became widely publicised in 2009 when the U.S. National Research Council published a landmark report on forensic sciences.¹²²⁷ The report points out that, as the accuracy and reliability of friction ridge studies are unknown, assertion that these fingerprint reports have 0% error rates are scientifically implausible.¹²²⁸ Again, while examining this issue in 2016, the

¹²²⁰ P6 and P17.

¹²²¹ Cole, Simon. "What counts for identity? The historical origins of the methodology of latent fingerprint identification." *Science in Context* 12.1 (1999): 139-172, p 140.

¹²²² Oig, A., *Review of the FBI's Handling of the Brandon Mayfield Case*, OFFICE OF THE INSPECTOR GENERAL, OVERSIGHT AND REVIEW DIVISION, US DEPARTMENT OF JUSTICE 1 (2006).

¹²²³ Stacey RB, *Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case*, (2005) 7(1) Forensic Science Communications.

¹²²⁴ Application for Material Witness Order and Warrant Regarding Witness: Brandon Bieri Mayfield, In re Federal Grand Jury Proceedings 03-01, 337 F. Supp. 2d 1218 (D. Or. 2004) (No. 04-MC-9071).

¹²²⁵ Emma, *Forensics Under the Microscope: Unproven Techniques Sway Courts, Erode Justice*, PSYCHOLOGY AND CRIME NEWS (24 October 2004), <http://crimepsychblog.com/?p=153.s>.

¹²²⁶ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,9 (2021).

¹²²⁷ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* 136 (National Academies Press, 2009).

¹²²⁸ *Ibid.*

President's Council of Advisors on Science and Technology (PCAST)¹²²⁹ in the US found that only two properly designed studies of latent fingerprint analysis had been conducted. Both these studies found the rate of false matches (known as "false positives") to be very high: 1 in 18 and 1 in 30. The reports together raised a demand for accurate and reliable forensics. These problems inherent in the fingerprint comparison task have led researchers, the press, and the legal system to challenge the assertions that the fingerprint technique is an exact science and of a zero error rate.¹²³⁰ The American Association for the Advancement of Science (AAAS) has questioned the scientific validity of fingerprint analysis.¹²³¹ The ability of any examiner to 'individualise' without the potential for any error at the claimed level of one person in the whole of human history is not scientifically validated.¹²³² One may counter-argue that 100% certainty is not a precondition for the admissibility of expert evidence.¹²³³ Yet, the inappropriateness of claiming 100% accuracy without a scientific basis is what has caused injustice to wrongfully convicted people. Undoubtedly, uncertainties in scientific testing or evaluations are acceptable as it is a part of science. The problem lies with the unsupportable claims and assertions about the accuracy of the technique to 100%. To be clear, the scientific reviews were not entirely critical. Latent fingerprint comparison is recognised as a valuable subjective procedure that has the potential to assist with identification.¹²³⁴ Yet, it is equally significant that the extent of accuracy and reliability of fingerprint evidence is clearly understood and appreciated by the judicial decision-makers.

5.4.1.3 Ballistic

A remarkable shift in responses was observed in relation to ballistic evidence. Judges were almost unambiguous in their response to ballistic evidence. All participants agreed

¹²²⁹ Report to the President, *Forensic science in criminal courts: ensuring scientific validity of Feature Comparison Methods*, 1 (Sep, 2016).

¹²³⁰ Haber, Lyn and Ralph Norman Haber, *Error Rates for Human Latent Fingerprint Examiners*, In *Automatic Fingerprint Recognition Systems*, SPRINGER NY 339 (2004).

¹²³¹ Anne Q Hoy, *Fingerprint Source Identity Lacks Scientific Basis for Legal Certainty*, AAAS (Sept. 14, 2017).

¹²³² A Campbell, *The Fingerprint Inquiry Report*, 43 EDINBURGH, SCOTLAND: APS GROUP SCOTLAND 790, 683 (2011).

¹²³³ *Ibid.*

¹²³⁴ C Champod and J Vuille, *Scientific Evidence in Europe--Admissibility, Evaluation and Equality of Arms*, 9(1) INTERNATIONAL COMMENTARY ON EVIDENCE (2011).

that such a technique should be used only when further corroborating evidence exists. P2 mentioned that the extent to which corroboration is sought shall depend on the genuineness of the report, whether the opposite party contests the report, etc. He further averred that ballistic evidence is similar to a liquor test report and is mostly admitted unless there is a contestation of the report findings. Only two participants held that no corroboration is required before placing reliance on ballistic evidence.¹²³⁵ P12 opined that ballistic evidence is 100 percent reliable. Three participants refused to comment as they were not aware of the reliability of ballistic evidence for lack of experience.¹²³⁶

As per judicial precedents also, ballistics as a forensic technique has not attained perfection.¹²³⁷ The element of subjectivity inherent in the technique makes it susceptible to error. In the case of *Mir Abbas Hayat Khan's case*,¹²³⁸ it was held that ballistic evidence needs to be corroborated with the help of other evidence, and it is unsafe to convict a person solely on the basis of ballistic evidence.¹²³⁹

5.4.1.4 Handwriting

Majority of the judges, i.e., 16 participants, answered that handwriting evidence cannot be acted on without corroboration. The following are the most relevant responses of the participants:

- “Handwriting evidence cannot be the sole piece of evidence.” (P9)
- “Depends on nature of evidence.” (P11)
- “Ball pen is hard to determine. While, handwriting in ink pen is easy to identify. There is no sure short formula.” (P5)
- “There may be a case where the accused says that the signature on the deed is not mine. But the FSL report says that the contested signature belongs to the accused. Then, the accused being an interested witness, will be given less preference. Handwriting is not so exact - they talk about curves and breakage and smoothness is there or not. It may be ignored if the circumstances are such. like other witnesses are there.” (P2)

¹²³⁵ P12 and P13.

¹²³⁶ P8, P9 and P17.

¹²³⁷ *Surat Singh v. State*, 1969 SCC OnLine P&H 206.

¹²³⁸ *Mir Abbas Hayat Khan v. Emperor*, 1937 SCC OnLine Pesh. 11.

¹²³⁹ *Id.* para 9.

- “The decision varies depending on the circumstances of the case. For example, in a case of fraud by post master, it was alleged that postmaster forged the signature of public and withdrew amount from their account. The complainant had denied his signature. But other circumstantial evidence and FSL report pointed out that the signature it was his signature. In that case, preference was given to the FSL report and not the oral evidence of the complainant.” (P1)

The responses of the participants indicate that they were more familiar with handwriting evidence than other kind of evidence, as they gave elaborate responses. P5 provided some practical information that writing with an ink pen is easier to identify in comparison to writing with a ball point pen. P2 illustrated that handwriting is preferred over the oral evidence of a interested witness. Yet, the decision to rely or not rely on handwriting evidence is a factual decision. Similarly, P1 explained, with a help of a real-life instance, that handwriting evidence along with other circumstantial evidence would be preferred over the bare assertion by a witness that the signature does not belong to him. Overall, it can be said that the participants were very familiar with the handwriting evidence and its usage. Their responses were in line with the legal precedents set by the Supreme Court. The participants fully understood that handwriting evidence is substantially different from other reliable techniques such as DNA, and therefore, a more cautious approach shall be adopted while relying on handwriting evidence. Two participants believed that handwriting evidence is highly reliable and 100% accurate.¹²⁴⁰ While, the other two had no experience with this kind of evidence.¹²⁴¹

The Supreme Court and High Courts also have time and again held that given the imperfect nature of the science of identification of handwriting, courts shall adopt a cautious approach.¹²⁴² Additionally, the Supreme Court has laid down that before acting on the evidence of a handwriting expert, two things must be established: the authenticity of the specimen and the competence of the expert.¹²⁴³ Just as in the case of DNA, the worthiness of the handwriting report would be determined by keeping in view the

¹²⁴⁰ P12 and P13.

¹²⁴¹ P8 and P17.

¹²⁴² *Sunil Chowdhury v. Arup Kumar Ghosh*, (2006) 2 CHN 347, para 21.

¹²⁴³ *State of Maharashtra v. Sukhdev Singh*, (1992) 3 SCC 700.

authenticity of the specimen taken for comparison. The signature of a person changes with time. Thus, the use of an old signature specimen may not be suitable for comparison.

5.4.2 SECONDARY TO OCULAR EVIDENCE

The other rule for the evaluation of forensic evidence is that they are considered secondary to direct evidence. The Supreme Court of India, on numerous occasions, has held that in case of conflict between expert evidence and ocular evidence, the eye witness shall be given primacy if it is reliable.¹²⁴⁴ Yet, the presence of contradictory expert evidence shall have a bearing on the weight of the ocular evidence. There may be some exceptional situations wherein the court would give preference to expert evidence over ocular evidence. For instance, if the medical evidence totally negates the ocular evidence, the court may, keeping in view the totality of facts and circumstances, give primacy to the medical evidence.

When the participants of the study were questioned about their strategy when presented with contradicting evidence, one direct and the other expert, all participants said that they would give preference to direct evidence. The judges looked to be rather convinced about their evidence rating. The judges responded with a great degree of confidence and certitude. The following are the justifications provided by some of the participants:

- “Expert evidence is not binding. The court may choose to not rely on expert evidence. For example, in a case of forgery, complainant says my signature have been forged and the expert report says that the two signature (sample and questioned signature) match and are from the same person. In that case, forensic report will be discarded.” (P1)
- “Depends on how contradictory the evidence is. If there is a reasonable probability that the accused had committed the offence, then he shall be convicted. Judges shall not stick to the rule of 'beyond reasonable doubt' blindly. Too much reliance on the rule would frustrate the purpose of law. There are so many loopholes in law. Reasonable possibility is there of accused being culprit, then he shall be punished. Same time, sole reliance on forensic evidence is not warranted. The worthiness of

¹²⁴⁴ *Bhupen Kalita v. State of Assam*, 2020 SCC OnLine (Gau.) 2230; *State of Uttarakhand v. Darshan Singh*, (2020) 12 SCC 605; *State of U.P. v. Hari Chand*, (2009) 13 SCC 542; *Solanki Chimanbhai Ukabhai v. State of Gujarat*, AIR 1983 SC 484.

expert evidence is at a lower pedestal than ocular evidence. There is no fixed rule. I say that in case of clinching oral evidence, contradictory forensic report may be discarded. Again, what is clinching is very subjective and would vary from judge to judge. So forensic evidence is an aid. It helps the judiciary in both punishing and acquitting. But it cannot be put at the highest pedestal. Because, what is heard and seen factually and actually is more reliable. cannot be ignored.” (P3)

- “The court needs to adopt a cautious approach.” (P13)

The above-mentioned responses show that primarily expert evidence are considered as a mere aid in the decision-making process, risky and non-binding, as they are only opinions and are not a testimony of something that the expert has seen himself. These responses also indicate that the choice between expert evidence and direct evidence is made based on the totality of the facts. The judges, as a rule, are required to give first preference to direct evidence. But such a rule is not too rigidly applied. It can be deviated from in an appropriate situation, such as if the forensic technique used by the expert is very clinching or discarding expert evidence would frustrate the purpose of the law.¹²⁴⁵ For instance, P11 referred to the case of *N.D.Tiwari*.¹²⁴⁶ In this case, the court gave preference to DNA evidence over direct evidence. Further, P5 states that:

- “Direct evidence is the best evidence. But mostly the direct evidence is not available to the court. And mostly the cases are decided as per the circumstantial evidence. In those cases, forensic evidence is very crucial. Like in Aarushi murder case, there was no direct evidence and the forensic evidence could have played a major role in decision making. But, unfortunately, the collection of evidence was not properly done in Aarushi case. Forensic team and infrastructure need to be effective. Decisions are taken based on complete chain of events. Every fact shall have to be proved. A single loophole created in any such fact can shatter the prosecution’s case.” (P5)

Overall, the participants did not approve of a blanket rule giving primacy to direct evidence over expert evidence. Expert evidence may be preferred if it is more conclusive and reliable than direct evidence. As a caution, the judge said that all the evidence and

¹²⁴⁵ P2 and P10.

¹²⁴⁶ *Narayan Dutt Tiwari v. Rohit Shekhar*, (2012) 12 SCC 554, para 53.

circumstances must be considered together before determining which evidence should be prioritised.

5.4.3 SURVEY FINDINGS ON THE NEED FOR CORROBORATION

The common perception of forensic procedures among judges is that it is safe to seek corroboration of forensic evidence. And the extent to which corroboration shall be sought is dependent on the nature of the technique. As was seen in section 5.4.1.1, in the case of DNA, 11 participants held that corroboration is not required. The number decreased to 9 in the case of fingerprint evidence. Lastly, with respect to ballistic and handwriting expert evidence, majority believed that seeking corroboration is a better approach. This shows that judges believed that the unreliability of a forensic technique can be countered with the help of corroborating evidence. It was found that the judges tended to be more worried about the weight of the evidence rather than the reliability of the forensic evidence. Most of the judges noted that in a trial, forensic evidence is seldom the only evidence submitted to them. Other pieces of evidence are also available to the court. For instance, in a rape case, the presence of DNA is not enough. The court has to examine whether the conduct was consensual or not. The proof of consent would be demonstrated by means of various other pieces of evidence. Likewise, fingerprint evidence may indicate the presence of a person at the crime scene. But the fact that the crime was committed by that individual solely needs further evidence. Thus, the judges said that the issue of solely relying on forensic evidence never arise in practice. Cases are determined with the use of more than one piece of evidence. It is crucial to note that the judges appeared to be less worried about the reliability assessment of the forensic approach since there is always additional corroborative evidence to complete the chain of events. Thus, even if the forensic approach is faulty, the other evidence would make up for the inaccuracy. Corroboration is regarded as the cure for all the limitations of forensic evidence. This approach of the judges seems to be the consequence of lack of a standard for the assessment of forensic evidence.¹²⁴⁷ The courts, in the absence of reliability criteria, have established the rule of corroboration as a mechanism to put a check on undue reliance on forensic evidence.¹²⁴⁸ However, corroboration as a method

¹²⁴⁷ Dinkar V.R., *Interpreting Scientific Expert Evidence – With Special Emphasis on the Admissibility and Probative Value of DNA Identification Evidence* (May, 2005) (Ph.D. dissertation, Mahatma Gandhi University).

¹²⁴⁸ *Ibid.*

is not efficient in resisting the invasion of unreliable expert testimony.¹²⁴⁹ “It cannot be viewed as an effective criterion in analysing scientific evidence as a substitute for standards like *Daubert* and *Frye*.”¹²⁵⁰

The procedural factors, such as the appropriate sealing of the sample acquired at the crime scene and its proper storage, seemed to weigh on the mind of the judges more than the basic shortcomings of the forensic technique itself. The judges concluded that no matter how reliable the method is, the dangers of mistreatment and manipulation are always present. Therefore, it is never safe to depend on opinion evidence.

The findings are similar to the results of the survey research by *Esther and Siyu*.¹²⁵¹ The participants in the study by *Ester and Siyu* reported similar responses. To quote, one of the judges noted that DNA evidence is simply one piece of the jigsaw puzzle and cannot demonstrate all of the components of the crime.¹²⁵²

The most worrisome element of the findings is that most of the judges associated exactness with fingerprint identification as a technique. This is in total contrast with latest scientific insights. Reports by National Academy of Science, National Institute of Justice, National Institute of Standards and Technology, International Association for Identification and Scientific Working Group for Friction Ridge Analysis Study and Technology suggest that reports of fingerprint identification cannot be characterised as infallible.¹²⁵³ It is fallacious to reason out that fingerprint identification as highly accurate on the premise that human fingerprints are unique.¹²⁵⁴ Yet, it was found that judges associated terms, such as exact science, established science, evolved science, and 100% reliable, with fingerprint evidence. Such an erroneous and scientifically unsupportable perception among judges is worrisome. And many of the judges would not even seek corroboration in the case of fingerprint evidence.

Other cautionary measure practiced by courts is that expert evidence shall be considered secondary to direct evidence. But this is also not helpful in cases where there is no direct

¹²⁴⁹ *Ibid.*

¹²⁵⁰ *Ibid.*

¹²⁵¹ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1 (2021).

¹²⁵² *Id.* at 8-9.

¹²⁵³ Simon A. Cole, *Scandal, Fraud, and the Reform of Forensic Science: The Case of Fingerprint Analysis*, 119 W. VA. L. REV. 523,530 (2016).

¹²⁵⁴ *Ibid.*

evidence and all the evidence are circumstantial. Moreover, this rule is also subject to the reliability of the expert evidence. If the reliability is high, the court would not hesitate in treating expert evidence as primary evidence. The problem with application of this rule is that the reliability of an expert evidence is not tested in a scientific manner. An outdated legal precedent that affixes the reliability of a forensic technique would be followed by the lower courts as a mandate of law. This is a disregard of the scientific changes taking place with respect to that technique. For instance, fingerprint that was once considered exact has lost that status, yet the old precedents are being adhered to by the trial court judges.

5.5 LACK OF SCIENTIFIC TRAINING

From the very beginning, both science and law as subjects of study have occupied an epistemically dominant position and authority.¹²⁵⁵ The two subjects also have a close relationship.¹²⁵⁶ They evolved together, resulting in mutual interactions between them.¹²⁵⁷ Law has benefited enormously from scientific assistance in problem solving. Numerous scientific tools have transformed legal processes, such as electronic case management, e-filing of documents in courts, electronic databases for case research, etc.¹²⁵⁸ Simultaneously, the need for scientific discoveries for legal purposes has boosted scientific research.¹²⁵⁹ The pursuit of the truth, founded on facts and evidence, is not restricted to the sphere of law.¹²⁶⁰ The objective of scientific research is also to discover the truth via evidence.¹²⁶¹ Both science and law play critical roles in securing the administration of justice and fostering public faith in the country's legal system.¹²⁶²

¹²⁵⁵ Simon A. Cole & Gary Edmond, *Science without Precedent: The Impact of the National Research Council Report on the Admissibility and Use of Forensic Science Evidence in the United States*, 4 BRIT. J. AM. LEGAL STUD. 585,587 (2015).

¹²⁵⁶ Wong, Ronald JJ, *Judging between conflicting expert evidence: Understanding the scientific method and its impact on apprehending expert evidence* 26(1) Singapore Academy Of Law JOURNAL 169 (2014).

¹²⁵⁷ ALcocEbA GiL, Juan Manuel, *The standards of scientificity as a criterion for the admissibility of scientific research*, 4(1) Brazilian Journal of criminal Procedural Law, Porto Alegre, 215,217 (Jan./Apr. 2018).

¹²⁵⁸ 6 *Benefits of using Technology in the Legal Industry*, <http://legodesk.com/blog/legal-practice/6-benefits-of-using-technology-in-the-legal-industry/> (last visited April 30th, 2022).

¹²⁵⁹ Dinkar V.R., *Interpreting Scientific Expert Evidence – With Special Emphasis on the Admissibility and Probative Value of DNA Identification Evidence* (May, 2005) (Ph.D. dissertation, Mahatma Gandhi University).

¹²⁶⁰ L Loevinger, *Standards of Proof in Science and Law*, 32 JURIMELRICSJOURNAL 323 (1992).

¹²⁶¹ Lirieka Meintjes-Van der Walt, *Decision-Makers' Dilemma: Evaluating Expert Evidence*, 13 S. Afr. J. Crim. Just. 319 (2000).

¹²⁶² Goudge, S.T., 2007. Inquiry into pediatric forensic pathology in Ontario. *Inquiry into Pediatric Forensic Pathology in Ontario*, p 10.

But there are several areas where the two subjects seem to be in a state of competition for legitimacy.¹²⁶³ One such field is the use of forensic science in legal proceedings.¹²⁶⁴ This area has been a source of contention. While forensic science is providing an ever-increasing contribution to accurate decision-making, wrongful convictions owing to the misapplication of forensic science have posed a danger to the integrity of the legal system.¹²⁶⁵

5.5.1 BASIC DISSIMILARITIES BETWEEN SCIENCE AND LAW

Lawyers and scientists seem to inhabit different worlds.¹²⁶⁶

Forensic science may be thought of as a synthesis of science and law. As a result, the fundamental tenets of both science and law will serve as the foundation for forensic science. Since science and law are fundamentally distinct fields of study, it is critical to have a broad understanding of the distinctions between science and law. The use of science in courts in the form of forensic science has also elucidated the fundamental distinctions between science and law. The conflict between the two issues arises as a result of the disparate approaches used by the two subjects in their quest for truth. Science looks for truth in the laboratories, and the law seeks truth in courtrooms.¹²⁶⁷ Law and science are culturally incompatible due to their divergent perspectives on the world.¹²⁶⁸ Consequently, “the realities of science often do not satisfy the needs of the law.”¹²⁶⁹ Indeed, law wants evidence, which is not necessarily synonymous with truth.¹²⁷⁰

Science is not a body of absolute truths. It is, instead, representative of a process involving continuous refining and churning of theoretical explanations about the universe.¹²⁷¹ To begin with, it is necessary to recognise that scientific knowledge is

¹²⁶³ *Ibid.*

¹²⁶⁴ *Ibid.*

¹²⁶⁵ Paul Roberts, *Science in the Criminal Process*, 14 OXFORD J. LEGAL Stud. 469 (1994).

¹²⁶⁶ Ian Binnie, *Science in the Courtroom: The Mouse That Roared*, 56 U.N.B.L.J. 307 (2007).

¹²⁶⁷ *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 596-97 (1993).

¹²⁶⁸ Sarah Lucy Cooper, *The Collision of Law and Science: American Court Responses to Developments in Forensic Science*, 33 Pace L. Rev. 234,238 (2013).

¹²⁶⁹ Waters, Nicole L., and Jessica P. Hodge, *The Effects of the Daubert Trilogy in Delaware Superior Court*, National Center for State Courts I (2005).

¹²⁷⁰ Sarah Lucy Cooper, *The Collision of Law and Science: American Court Responses to Developments in Forensic Science*, 33 Pace L. Rev. 234,238 (2013).

¹²⁷¹ *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 596-97 (1993), at 590.

social knowledge. Scientific information is valuable when applied to a particular context. *Robert Smith* explains, “what is a certain and hence a ‘scientific’ fact for one purpose is not for another.”¹²⁷² Science should not be construed as possessing knowledge of absolute truths. As a whole, science is inherently uncertain and rife with disagreements and controversies.¹²⁷³ “Science is a contentious process, rather than a catalogue of truths.”¹²⁷⁴ Scientific knowledge undergoes changes perpetually. It is a fundamental tenet of science that established knowledge shall be questioned and new discoveries shall be created.¹²⁷⁵ For instance, it was formerly widely believed that the Earth is flat. The belief was a reality during those times and was very difficult to reject. However, scientific findings finally established that the Earth is round. It was established that it is the Earth that revolves around the Sun, and the Sun does not revolve around the Earth.¹²⁷⁶

A judge should not see science as normative or as a collection of unchanging rules. Science is social in nature. It is always developing.¹²⁷⁷ Uncertainty is, in fact, a symbol of good science.¹²⁷⁸ Law, in contrast, shall resolve disputes with finality in a time-bound manner.¹²⁷⁹ Law needs to decide in a fixed time. To expect finality, which is a core value of any legal system, from forensic fields would not be appropriate.¹²⁸⁰ As all scientific fields are perpetually evolving.¹²⁸¹ Scientific knowledge is always provisional.¹²⁸² It

¹²⁷² Smith, R. and Wynne, B. Eds., *EXPERT EVIDENCE: INTERPRETING SCIENCE IN THE LAW*, 15 (London: Routledge, 1989).

¹²⁷³ Wong, Ronald JJ, *Judging between conflicting expert evidence: Understanding the scientific method and its impact on apprehending expert evidence* 26(1) Singapore Academy Of Law JOURNAL 169,171 (2014).

¹²⁷⁴ Beyea, Jan, and Daniel Berger, *Scientific Misconceptions among "Daubert" Gatekeepers: The Need for Reform of Expert Review Procedures*, 64 LAW AND CONTEMPORARY PROBLEMS 327 (2001).

¹²⁷⁵ Evett, I.W., *Expert evidence and forensic misconceptions of the nature of exact science*, 36(2) Science & justice 118,121 (1996).

¹²⁷⁶ *Ibid.*

¹²⁷⁷ Mara L. Merlino; Victoria Springer; Jan Seaman Kelly; Derek Hammond, *Meeting the Challenges of the Daubert Trilogy: Refining and Redefining the Reliability of Forensic Evidence*, 43 TULSA L. REV. 417, 446 (2007).

¹²⁷⁸ Sander Greenland, *The Need for Critical Appraisal of Expert Witnesses in Epidemiology and Statistics*, 39 WAKE FOREST L. Rev. 291, 295 (2004).

¹²⁷⁹ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S.Ct. 2786, 2798 (1993).

¹²⁸⁰ Goudge, S.T., *Inquiry into Pediatric Forensic Pathology in Ontario*, 9 (2007).

¹²⁸¹ *Ibid.*

¹²⁸² Cedric C.Gilson, *The Admissibility of Expert Evidence in Criminal Proceedings in England and Wales:*

A Response,

https://westminsterresearch.westminster.ac.uk/download/a1b9c9ba802b44bd39f4387b6aba793aa661c84cde23bf181a140314c8106b9d/345701/Gilson_2009.pdf (last visited April 30th, 2022).

never concludes.¹²⁸³ It is critical for the legal community to be fully informed of this nature of science.

One fine example in this regard would be the use of CBLA (Comparative Bullet Lead Analysis) evidence by the FBI for 30 years in investigation and in court testimony.¹²⁸⁴ This technique was used to see whether the chemical composition of a bullet matched with that of the ammunition found with the suspect. It was only after one retired FBI expert questioned the use of this technique that the National Academy of Sciences (NAS) undertook the task to study this technique. NAS found that testimony provided by the expert regarding CBLA in courts, such as “could have come from the same box of ammunition manufactured on the same day,”¹²⁸⁵ is not statistically supportable. The report concluded that “the available data do not support any statement that a crime bullet came from a particular box of ammunition.”¹²⁸⁶ CBLA came to be discontinued in 2004, after the NAS report. Although the FBI stopped using CBLA, the Bureau's conduct in first using the technique and then abandoning it after it was challenged gives an insight into how forensic knowledge changes as more and more research is carried out.

Another illustrative example of the changed status of forensic evidence is the use of a two-finger test for the assessment of virginity. The practice of conducting the two-finger test as part of rape detection is prevalent in many countries, such as Afghanistan, Brazil, Egypt, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Libya, Malawi, Morocco, Occupied Palestinian Territories, South Africa, Sri Lanka, Swaziland, Turkey, the United Kingdom of Great Britain and Northern Ireland and Zimbabwe.¹²⁸⁷

The World Health Organisation in 2018 took cognisance of a systematic review of the virginity test.¹²⁸⁸ The review concluded that this test is medically worthless.¹²⁸⁹ It appealed that there is a need to update the medical textbooks and inform the medical

¹²⁸³ *Ibid.*

¹²⁸⁴ Giannelli, Paul C., *Comparative Bullet Lead Analysis: A Retrospective*, Faculty Publications, 97 (2010), https://scholarlycommons.law.case.edu/faculty_publications/97.

¹²⁸⁵ *State v. Grube*, 126 Idaho 377, 883 P.2d 1069, 1078 (1994); *People v. Johnson*, 114 Ill. 2d 170, 102 Ill. Dec. 342, 499 N.E.2d 1355, 1366 (1986).

¹²⁸⁶ *National Academy of Sciences, Forensic Analysis: Weighing Bullet Lead Evidence*, National Research Council, 6,7 (2004).

¹²⁸⁷ WORLD HEALTH ORGANIZATION, ELIMINATING VIRGINITY TESTING: AN INTERAGENCY STATEMENT, No. WHO/RHR/18.15, 7 (2018).

¹²⁸⁸ *Id.* page 4.

¹²⁸⁹ Olson, Rose McKeon, and Claudia García-Moreno, *Virginity testing: a systematic review*, 14(1) REPRODUCTIVE HEALTH 1,8 (2017).

professionals about the current medical knowledge.¹²⁹⁰ The World Health Organisation approved the review findings and confirmed that virginity testing is devoid of any scientific merit.¹²⁹¹ Yet, the test is still being practised around the world.¹²⁹² More worrisome is the fact that this fact is still part of medical training and textbooks.¹²⁹³ The Bangladesh High Court banned the two-finger test in 2018. In India, the test was banned in 2014.¹²⁹⁴ This clearly illustrates the changing nature of scientific findings.

This is not to say that the law is not adaptive and that only science is subject to changes. Law also evolves and changes with time and the evolving demands of society. The only issue is that the legislation is too sluggish to respond to the changes resulting from scientific developments.¹²⁹⁵

Additionally, whereas science seeks to comprehend universal or general truths with the use of specific data, law seeks to resolve a particular/specific disagreement by the application of general principles.¹²⁹⁶ A scientist's objective is to reach conclusions that can be applied to bigger populations. A scientist is interested in findings that are general in nature and not case-specific results.¹²⁹⁷ Science is understood as a means of testing predictions or factual assertions about the world or the universe.¹²⁹⁸ In a legal dispute, the facts would vary according to the circumstances. A judge's primary purpose is to resolve the issue limited to the parties involved in the case.

Science is concerned with reproducible discoveries. Scientific discoveries are valid when they can be replicated using the same experiments conducted under identical conditions. Replicability is a basic tenet of science's ethics. On the contrary, the law

¹²⁹⁰ *Ibid.*

¹²⁹¹ World Health Organization. *Eliminating virginity testing: an interagency statement*. No. WHO/RHR/18.15. World Health Organization 4 (2018).

¹²⁹² *Id.* page 5.

¹²⁹³ SUBRAHMANYAM BV, editor, *MODI'S MEDICAL JURISPRUDENCE AND TOXICOLOGY* (New Delhi: Butterworths India, 2001); Parikh CK, *PARIKH'S TEXTBOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY FOR CLASSROOMS AND COURTROOMS* (New Delhi: CBS Publishers and Distributor, 2005); NARAYAN REDDY KS, *THE ESSENTIALS OF FORENSIC MEDICINE AND TOXICOLOGY* (Hyderabad: K Suguna Devi, 26th ed. 2007).

¹²⁹⁴ Ministry of Health and Family Welfare, Government of India, *Guidelines and Protocols, Medico-legal Care for survivors of Sexual Violence*, (2014) <https://main.mohfw.gov.in/sites/default/files/953522324.pdf>.

¹²⁹⁵ Robin Feldman, *Historic Perspectives on Law & Science*, 2009 STAN. TECH. L. REV. 1 (2009).

¹²⁹⁶ DAVID L. FAIGMAN, *LEGAL ALCHEMY: THE USE AND MISUSE OF SCIENCE IN THE LAW* 69 (1999).

¹²⁹⁷ Waters, Nicole L., and Jessica P. Hodge, *The Effects of the Daubert Trilogy in Delaware Superior Court*, National Center for State Courts 1 (2005).

¹²⁹⁸ Faigman, David L, *Is science different for lawyers?*, 297.5580 SCIENCE 339 (2002).

requires that disputes be resolved using a unique set of factual matrixes. Indeed, the factual matrix of a case is hardly replicable. Another trial in a different jurisdiction with the same set of facts may not lead to the same decision. For the legal fraternity, the idea of replicability is meaningless.¹²⁹⁹

The proof standard used in the two disciplines is distinct.¹³⁰⁰ Scientific research demands a very high standard of evidence.¹³⁰¹ A degree of confidence of 95% is required.¹³⁰² Scientists would have to demonstrate that the findings were unaffected by random fluctuation, systematic mistakes, or biases.¹³⁰³ However, the legal standards of evidence are not strict. It varies according to the kind of case, from "preponderance of the evidence" in civil proceedings to "proof beyond a reasonable doubt" in criminal ones.¹³⁰⁴

Another distinction between science and law is that scientific research does not take common sense into account.¹³⁰⁵ Science is devoid of common sense. Common sense-based beliefs may be scientifically incorrect or useless.¹³⁰⁶ Science takes a very distinct approach from other fields. In scientific domains, common sense, predictions, and beliefs have no place.¹³⁰⁷ In science, observation takes precedence above any number of possible explanations or rationalisations.¹³⁰⁸

A further distinction between science and law is that law is not universal.¹³⁰⁹ However, science is universal. Science is universal, like music, dance, or poetry.¹³¹⁰ Law is developed in response to a country's unique requirements and circumstances. It varies from one nation to another. However, scientific knowledge stays constant spatially.

¹²⁹⁹ Solomon, Shana M., and Edward J. Hackett, *Setting boundaries between science and law: Lessons from Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 21(2) SCIENCE, TECHNOLOGY, & HUMAN VALUES 131,149 (1996).

¹³⁰⁰ *Ibid.*

¹³⁰¹ *Ibid.*

¹³⁰² *Ibid.*

¹³⁰³ *Ibid.*

¹³⁰⁴ *Ibid.*

¹³⁰⁵ LEWIS WOLPERT, WHAT LAWYERS NEED TO KNOW ABOUT SCIENCE, 290 (Helen Reece (ed.) Law and Science (Oxford University Press 1998).

¹³⁰⁶ *Ibid.*

¹³⁰⁷ Dinkar V.R., Interpreting Scientific Expert Evidence – With Special Emphasis on the Admissibility and Probative Value of DNA Identification Evidence (May, 2005) (Ph.D. dissertation, Mahatma Gandhi University).

¹³⁰⁸ *Ibid.*

¹³⁰⁹ *Ibid.*

¹³¹⁰ C.P. Rajendran, *A day to embody the true spirit of science*, HINDU, Feb 28, 2022, at 6.

Scientific knowledge is the same for people of different countries.¹³¹¹ The science is not confined to nations and is not country specific as Indian science or American science.¹³¹²

5.5.2 EPISTEMIC DISCONNECT

Daubert puts federal judges in an uncomfortable position.

-Judge Alex Kozinski

5.5.2.1 Legal Education

Law schools prepare students to think, write, and do research in the manner of a lawyer. However, outside of the law school, a whole other set of skills is necessary.¹³¹³ *Kesan* argues that judges do not think like scientists and hence are unable to make scientific assessments.¹³¹⁴ Law school curriculum does not adequately educate judges to comprehend complicated statistical data or fundamental principles of scientific research. Judges cannot be expected to be scientifically knowledgeable.¹³¹⁵

5.5.2.2 Informed Judge

The gatekeeping function of a judge is an onerous responsibility. Judges have to delve into matters outside the arena of their legal expertise or even general knowledge. For example, a judge has to evaluate a medico-legal report of an expert without having training in medicine.¹³¹⁶ The common-sense approach used to decide the admissibility of lay witnesses does not help in relation to forensic evidence.¹³¹⁷ Moreover, the skill set, experience, and knowledge required to assess forensic evidence are not made part of the legal curriculum.¹³¹⁸

The complex nature of scientific knowledge exacerbates the problem. Certain limits and weaknesses exist in forensic methodologies and techniques. A court should consider these ambiguities and limits inherent while evaluating any forensic evidence. Without

¹³¹¹ Dinkar V.R., *Interpreting Scientific Expert Evidence – With Special Emphasis on the Admissibility and Probative Value of DNA Identification Evidence* (May, 2005) (Ph.D. dissertation, Mahatma Gandhi University).

¹³¹² C.P. Rajendran, *A day to embody the true spirit of science*, HINDU, Feb 28, 2022, at 6.

¹³¹³ Purnima Arora, *Avoid Technical Goof Ups*, LAWYERS UPDATE (2017) <https://www.lawyersupdate.co.in/potpourri/a-lawyer-in-making/avoid-technology-goof-ups/> (last visited on Mar. 3, 2022).

¹³¹⁴ Jay P. Kesan, *An Autopsy of Scientific Evidence in a Post-Daubert World*, 84 GEO. L.J. 1985,2042 (1996).

¹³¹⁵ REDMAYNE, MIKE, *EXPERT EVIDENCE AND CRIMINAL JUSTICE*, 112 (Oxford University Press, 2001).

¹³¹⁶ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIM. Just. L & Soc'y 1,4 (2021).

¹³¹⁷ *Ibid.*

¹³¹⁸ *Ibid.*

knowledge of how science works, a judge would be unable to consider some essential aspects of science while analysing forensic evidence. Resultantly, judges are unable to accurately determine the probative value of scientific evidence. And, “a failure to become amateur scientist means their failure as professional judges.”¹³¹⁹

It is feared that in the face of such inability or failure to comprehend and analyse forensic evidence, judges may abandon their responsibilities to develop an independent conclusion on the expert report's validity. The judge may simply accept the evidence presented by the experts, particularly when it is very technical and complex.¹³²⁰ Also, the expert's failure to offer pertinent information to the court remains unreported. Judges are clueless to the limitations of the forensic approach and the insufficiency of the information supplied to the court.¹³²¹ *Epstein* asserts that judges' scientific illiteracy is one of the factors contributing to the current condition of forensic science, in which faulty expert testimony has resulted in erroneous convictions.¹³²²

It is critical to appreciate the danger that may result from the present state of affairs. Judges are ill-equipped to conduct the gatekeeping job effectively. They are naturally inclined to accept as scientific reality what experts tell them. The rule of prudence requiring corroboration of expert evidence is not an effective safeguard, as the rule only guards against sole reliance on expert evidence. It does not require the judges to probe into the actual probative worth of expert evidence. Thus, the danger of over-reliance on expert evidence remains. This reliance on experts is fraught with risk. Parties to a lawsuit retain and reward experts.¹³²³ The expert for the financially strong party would determine the fate of the case.¹³²⁴ Leaving judges as puppets in the hands of experts and litigating parties. Justice Binnie of the Supreme Court of Canada asserted

¹³¹⁹ David L. Faigman, *Judges as Amateur Scientists*, 86 B.U. L. REV. 1207,1225 (2006).

¹³²⁰ Law Commission, *Expert evidence in criminal proceedings in England and Wales*, 21 March 2011, Law Com No 325 (lawcommission.justice.gov.uk/areas/expert-evidence-in-criminaltrials.htm - accessed on 30/10/2012), p 3.

¹³²¹ Simon A. Cole & Gary Edmond, *Science without Precedent: The Impact of the National Research Council Report on the Admissibility and Use of Forensic Science Evidence in the United States*, 4 Brit. J. Am. Legal Stud. 585,617 (2015).

¹³²² *Id.* at 590.

¹³²³ W. Twining, *Preparing Lawyers for the Twenty First Century*, 3(1) LEGAL EDU. REV. 1,14 (1992); D.L. FAIGMANN, *LEGAL ALCHEMY: THE USE AND MISUSE OF SCIENCE IN THE LAW* (W.H. Freeman and Co., 1999).

¹³²⁴ S. Jasanoff, *Science at the Bar* (Harvard University Press, 1995); S. Jasanoff, ‘Just Evidence: The Limits of Science in the Legal Process’, 34(2) JOURNAL OF LAW, MEDICINE & ETHICS 328 (2006); S.L. Cooper, *The Collision of Law and Science: American Court Responses to Developments in Forensic Science*, 33(1) PACE L. REV. 234 (2013).

that scientific illiteracy is a major concern as the use of scientific evidence in courts is increasing.¹³²⁵ The judges generally rely on the research presented to the court by the lawyers, unmindful of the inadequacy of the information presented to them¹³²⁶

Judges should understand what questions to ask an expert, what components of testimony must be addressed, what information the expert must offer, and what a judge should request when pertinent material is not presented to the court. Unless and until a judge has this level of understanding, there can be no effective gatekeeping of forensic evidence.

People who are not scientifically trained tend to make erroneous judgments about scientific knowledge as certain and absolute.¹³²⁷ They consider the findings of an expert report as absolute truth, unmindful of the limitations and reservations. Justice Al-Khasawneh, in the case of *Argentina v. Uruguay*,¹³²⁸ has questioned if the judges are well-placed to handle scientifically complex matters.

The issue is not confined to expert report evaluation. Even the legal reliability test, such as *Daubert*, would need judges to have a working knowledge of science. *Daubert* as a standard for reliability testing is not well understood or comprehended by the legal fraternity and educating the lawyers and judges is an uphill task.¹³²⁹ A national survey of 400 state trial judges in the U.S. on the judges' capacity to interpret and implement *Daubert* reveals that a greater focus on science-based education for the judiciary is definitely required.¹³³⁰ To quote, it says: 'the practical value of *Daubert* for judges may never be fully realised unless judges are provided with sufficient judicial scientific education to allow them to perform their gatekeeping role.'¹³³¹

The survey revealed that judges lacked the required scientific knowledge and had difficulty in operationalising concepts such as rate of error and falsifiability. Only 5% of the participants of the survey study could clearly explain the term falsifiability, one

¹³²⁵ Janice Tibbetts, *Judges Ignorant of Science: Binnie*, OTTAWA CITIZEN. (March 8, 2003) A6.

¹³²⁶ *Ibid.*

¹³²⁷ David L. Faigman, *Judges as Amateur Scientists*, 86 B.U. L. REV. 1207,1211 (2006).

¹³²⁸ Judgment, 20 Apr. 2010, ICJ Reports (2010).

¹³²⁹ Jaems T. Richardson, Gerald P. Ginsburg, Sophia Gatowski & Shirley Dobbin, *The Problems fo Applying /Daubert to Psychological Syndrome Evidence*, 79 JUDICATURE 10,16 (1995).

¹³³⁰ Gatowski, S.I., Dobbin, S.A., Richardson, J.T., Ginsburg, G.P., Merlino, M.L. and Dahir, V., *Asking the gatekeepers: A national survey of judges on judging expert evidence in a post-Daubert world.*, 25(5) Law and Human Behavior 433 (2001).

¹³³¹ *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 596-97 (1993).

of the *Daubert* factors. And only 4% of judges would explain what it means by error rate.¹³³² These are important findings and should be a cause of great concern. The implementation of *Daubert* standards is meaningless if legal education is devoid of such basic scientific education.¹³³³

Another survey, including qualitative interviews with 41 state court judges in the U.S., also discovered that judges often lack an understanding of the scientific procedures involved in forensic evidence analysis.¹³³⁴

Chief Justice Rehnquist, in the *Daubert* decision, remarked that applying *Daubert* standards would require judges to become "amateur scientists." He was sceptical of judges' capacity to serve as gatekeepers, given the kind of training law school graduates get.¹³³⁵ Evaluation of forensic evidence as per *Daubert* standards would require educating judges about the fundamental of scientific methods, explanation of concepts such as falsifiability, limitations of scientific measurements, and the element of subjectivity involved in certain techniques.¹³³⁶

The lack of validity and reliability of certain forensic techniques involving feature comparison, such as fingerprint, ballistics, odontology etc., add fury to the fire.¹³³⁷ The NAS¹³³⁸ and the PCAST¹³³⁹ reports have revealed that some of the commonly used forensic techniques are inherently unreliable, especially the way the experts present the findings of such techniques. The techniques have been a major source of error in wrongful convictions that were unearthed by way of DNA exonerations.¹³⁴⁰ The judges are not trained to appreciate these limitations. The consequences of judges foraying into

¹³³² Gatowski, S.I., Dobbin, S.A., Richardson, J.T., Ginsburg, G.P., Merlino, M.L. and Dahir, V., *Asking the gatekeepers: A national survey of judges on judging expert evidence in a post-Daubert world.*, 25(50) Law and Human Behavior, 433,433 (2001).

¹³³³ *Id.* at 453.

¹³³⁴ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,10 (2021).

¹³³⁵ David L. Faigman, *Judges as Amateur Scientists*, 86 B.U. L. REV. 1207,1225 (2006).

¹³³⁶ VINODH KUMARSWAMY, REPORT OF THE LAW REFORM COMMITTEE ON OPINION EVIDENCE, 7 (2011).

¹³³⁷ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,10 (2021).

¹³³⁸ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, NATIONAL RESEARCH COUNCIL, 100 (2009).

¹³³⁹ REPORT TO THE PRESIDENT, FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE COMPARISON METHODS, 1 (Sep, 2016).

¹³⁴⁰ Editorial, *Junk Science at the F.B.I.*, N.Y. TIMES (Apr. 27, 2015), <https://www.nytimes.com/2015/04/27/opinion/junk-science-at-the-fbi.html>.

scientific matters without the required training could be disastrous, especially in criminal matters where the stakes are high.

To sum up, professionals in law mostly do not have any formal training to understand and evaluate forensic science in an informed way. Whereas, it is only a well-informed judge who can check whether the standard of the expert report presented to him is up to the mark or not. *Cheng*¹³⁴¹ asserts that the judges who comprehensively understand a scientific issue can make more sound scientific admissibility decisions. Therefore, judges ought to be imparted with training and education in basics of science.¹³⁴²

5.5.2.3 Training

The intersectionality of science and law has been the subject of many studies. One such study was carried out by the Carnegie Commission of Science & Technology (1993).¹³⁴³ This study coincidentally came out in the same year as the *Daubert* decision. The report acknowledges that the courts competency to deal with science-rich cases is constantly being questioned. The Report made recommendations that judges shall be given required scientific training and; that the legal and scientific communities shall engage with each other more.

The present scientific era demands that a new legal foundation shall be built that is sound in both science and law. The principles and practices that served the purposes of the law in the past are no longer adequate. They shall be displaced by new creative and innovative methods. This is the only way to save our legal system from becoming redundant. The traditional legal tools and methods have become out-dated in the wake of new and sophisticated crimes. Oral evidence that has been considered primary evidence so far is ridden with limitations, such as forgetfulness, external influence, observation power, etc. The legal system needs to strengthen forensic science and its application in law. Forensic science is free from the limitations that are associated with oral evidence. Judges need to develop a scientific temper and equip themselves with the knowledge to deal with the latest advances in the field of forensics. Creating a link

¹³⁴¹ Edward K. Cheng, *Independent Judicial Research in the Daubert Age*, 56 Duke L.J. 1263 1273 (2007).

¹³⁴² NAT'L ASS'N OF CRIMINAL DEF. LAW. (NACDL), PRINCIPLES AND RECOMMENDATIONS TO STRENGTHEN FORENSIC EVIDENCE AND ITS PRESENTATION IN THE COURTROOM 1 (2010), www.nacdl.org/WorkArea/DownloadAsset.aspx?id=17775.

¹³⁴³ *Science and Technology in Judicial Decision Making Creating Opportunities and Meeting Challenges*, Report of the Carnegie Commission on Science, Technology and Government (March, 1993).

between judges and scientists would enhance the confidence of judges in dealing with forensic evidence. Constant interaction and the exchange of ideas would help in educating judges.¹³⁴⁴ Periodical and continuing training of judges would help in developing legal rules and standards for assessing the reliability and weigh of various types of forensic evidence.¹³⁴⁵ Afterall, the least that gatekeeping function of judges requires is that judges shall be able to comprehend the forensic evidence presented to them. This, in some ways, means that judges shall have to fit into the shoes of an amateur or novice scientists.¹³⁴⁶ This is no longer an option for judges. There is no way assuming the role of an amateur scientist can be avoided by judges. They do not have any choice but to take the challenge head-on. Simply put, if the judges do not have a basic understanding of research methods and statistics, they are not in a position to accurately determine the worth of forensic evidence. The present legal education system does not prepare judges to assume the functions of a gatekeeper. It is beyond doubt that judges shall be trained in basic scientific knowledge. The pertinent query would be how this monumental and tedious task shall be undertaken.¹³⁴⁷ The training of judges shall include imparting knowledge on fundamentals of science, limitations of scientific methods,¹³⁴⁸ how they can monitor the handling of evidence, how the results of a scientific method shall be interpreted, etc.¹³⁴⁹

With the growth of science and technology exponentially, judges shall ensure that they are not lagging behind. Otherwise, this may result in a threat to the legitimacy of the legal system as a whole. *Faigman* goes to the extent of saying that “no judge will deserve the title if he or she does not know science.”¹³⁵⁰ Scientific education would enhance the confidence of the judiciary. It would improve the manner in which the reliability of forensic evidence is assessed. As a natural consequence, the problem of wrongful

¹³⁴⁴ *Dharam Deo Yadav v. State of U.P.*, (2014) 5 SCC 509, para 28.

¹³⁴⁵ Lirieka Meintjes-Van der Walt, *Decision-Makers' Dilemma: Evaluating Expert Evidence*, 13 S. Afr. J. Crim. Just. 319 (2000).

¹³⁴⁶ *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 601 (1993) (Rehnquist, C.J., concurring in part and dissenting in part).

¹³⁴⁷ David L. Faigman, *Judges as Amateur Scientists*, 86 B.U. L. REV. 1207,1209 (2006).

¹³⁴⁸ Beyea, Jan, and Daniel Berger, *Scientific Misconceptions among "Daubert" Gatekeepers: The Need for Reform of Expert Review Procedures*, 64(2/3) LAW AND CONTEMPORARY PROBLEMS 327 (2001).

¹³⁴⁹ Ambily P. and Ashna D., *Faulty Foundations: A Socio-Legal Critique of the Regulation of Forensic Science Laboratories in India*, NLUJ LR 191,242 (2021).

¹³⁵⁰ David L. Faigman, *Judges as Amateur Scientists*, 86 B.U. L. REV. 1207,1207 (2006).

decisions would be solved.¹³⁵¹ Even the Innocence Project promoted the scientific training of judges.¹³⁵²

One retired IPS (Indian Police Services) officer and Director General of the Bureau of Police Research and Development, in an answer to a question asked at a discussion organised by Pranab Mukherjee Foundation on “Criminal Justice System in India”, said,

Not only judiciary, but police, prosecution and judiciary all three have to undergo courses, training from time to time because their knowledge has to be updated. Everything changes so fast. Now, especially the technology is changing by minutes, if not by second. So, it requires that what knowledge I acquired when I entered the police service, has to be updated. I have to attend courses. Maybe I have to go to some university and attend classes. Every country judiciary is given training. But unfortunately, here, that much emphasis is given which should be given. Once training is given, they will learn new things, and I think they would perform better.¹³⁵³

From his personal experience, he said that even police are not sufficiently trained to deal with the technology they are confronted within the job as crime investigators. Judges shall be trained about the ways and manner in which they can illicit truth out of an expert testimony. The courts ought to enquire into the chances of random match and lab errors alongside data on which an expert bases his claims.¹³⁵⁴ The statistical value of lab errors is important information. A negligible probability of such errors or mistakes has a huge impact on the weight it deserves in courts.¹³⁵⁵ None of the forensic labs can claim that errors do not occur.¹³⁵⁶

¹³⁵¹ Jackson, G., Aitken, C. and Roberts, *Case assessment and interpretation of expert evidence. Guidance for judges, lawyers, forensic scientists and expert witnesses*, 4 PRACTITIONER GUIDE 5 (2015).

¹³⁵² INNOCENCE PROJECT, <https://www.innocenceproject.org/forensic-science-problems-and-solutions/> (last visited Mar. 6, 2022).

¹³⁵³ Discussion on the topic “Criminal Justice System in India”, organized by Pranab Mukherjee Foundation (2019).

¹³⁵⁴ Sangero, B., *Safety from Flawed Forensic Sciences Evidence*, Ga. St. UL Rev., 34,1129,1141 (2017).

¹³⁵⁵ Committee on Identifying the Needs of the Forensic Science Community, National Research Council, *Strengthening Forensic Science in the United States: A Path Forward*. NATIONAL ACADEMIES PRESS, 135 (2009).

¹³⁵⁶ William C. Thompson, *Tarnish on the “Gold Standard”: Understanding Recent Problems in Forensic DNA Testing*, 30 CHAMPION 10, 11–12, 13–14 (2006).

The issue relating to the scope of scientific training for judges is also relevant. Scholars have held that any such training need not be rigorous. The aim shall be to make judges capable of evaluating forensic evidence and statistical data accurately and critically. It is nobody's case that judges need to design or execute scientific tests themselves. They shall be comfortable with the basic scientific jargon, research methodology, etc. The level of education shall be such that judges know how they can extract information from an expert and what questions shall be asked. The training shall empower judges to be able to critically analyse the forensic reports.¹³⁵⁷ The observations made by *Faigman* are worth quoting:

the "scientific sea" is very wide and deep and that judges should at least know how to swim, i.e. have the basic skills necessary to read and understand scientific methods and to integrate scientific knowledge in their legal decisions, without actually having to make the swim across the entire breadth of science.¹³⁵⁸

Judges do not need the training to resolve scientific debates. They only need to be trained for the limited purpose of fulfilling their duty i.e., to settle down legal issue arising in the case before them.¹³⁵⁹ The appropriate scope and substance of a scientific training program for judges might be the topic of future research. The goal of this research is to ascertain the necessity for such training. The required education can be attained either before or during the litigation. The judicial training programs can provide the judges with a broad understanding of the issues involved in general. And, during the litigation, the judges may independently delve into library-based research.

In the U.S., the Reference Manual on Scientific Evidence by the Federal Judicial Centre has made efforts to help judges by providing scientific guidelines."¹³⁶⁰ The manual has been designed to act as a quick guide to specific forensic techniques. Trial judges have

¹³⁵⁷ Gatowski, S.I., Dobbin, S.A., Richardson, J.T., Ginsburg, G.P., Merlino, M.L. and Dahir, V., *Asking the gatekeepers: A national survey of judges on judging expert evidence in a post-Daubert world.*, 25(5) LAW AND HUMAN BEHAVIOR 433, 454-455 (2001)..

¹³⁵⁸ D.L.Faigman, *Mapping the labyrinth of scientific evidence*, 46 HASTINGS L. J. 579 (1995).

¹³⁵⁹ Dinkar V.R., *Interpreting Scientific Expert Evidence – With Special Emphasis on the Admissibility and Probative Value of DNA Identification Evidence* (May, 2005) (Ph.D. dissertation, Mahatma Gandhi University).

¹³⁶⁰ Federal Judicial CTR., *REFERENCE MANUAL on SCIENTIFIC EVIDENCE* (1994).

drawn benefits from short-term courses.¹³⁶¹ It works as a helpful and informative template. It has been drafted keeping in mind the specific needs of the judges. Some of the topics that the manual deals with are data collection, data presentation, comparisons, inference, base rates, association and causation, survey research, multiple regression, epidemiology, and DNA evidence.¹³⁶² With such guides, it is easily possible to assist judges in evaluating and understanding scientific evidence.¹³⁶³ To make the task easier for judges, the manual is thematically designed.¹³⁶⁴

In the U.K., the Royal Statistical Society in collaboration with the Nuffield Foundation, has tried to provide the judges with guides on various aspects of probabilistic reasoning and statistical evidence. These guides are meant to assist judges, lawyers, and forensic experts in dealing with the rising demand for modern scientific litigation. The aim of these guides is not to turn lawyers and judges into professors of statistics but to merely ensure the courtroom players have enough knowledge to properly discharge their responsibilities accurately and judiciously.¹³⁶⁵ The guides have been drafted by a panel of an interdisciplinary team that comprises lawyers, experts, and statisticians. There are four such guides covering topics ranging from the fundamentals of probability and statistical evidence, assessing the probative value of DNA evidence, the logic of forensic proof, etc.¹³⁶⁶ It is believed that these guides would meet the requirements of lawyers and judges and act as a handy for reference which is easy to refer to.¹³⁶⁷ The guides could be used by practitioners across the globe because, unlike the law of the land, the law of probability is valid irrespective of the geography.¹³⁶⁸

¹³⁶¹ Merilee M. Kapsa and Carl B. Meyer, *Scientific Experts Making Their Testimony More Reliable*, Cal. W. L. Rev. 313,328 (1999).

¹³⁶² Jackson, G., Aitken, C. and Roberts, P., *Case assessment and interpretation of expert evidence. Guidance for judges, lawyers, forensic scientists and expert witnesses*, (4) PRACTITIONER GUIDE 5 (2015).

¹³⁶³ Redmayne, Mike, *Expert evidence and criminal justice*, 113 (Oxford University Press, 2001).

¹³⁶⁴ *Science and Technology in Judicial Decision-Making Creating Opportunities and Meeting Challenges*, Report of the Carnegie Commission on Science, Technology and Government 26 (March, 1993); Joe S. Cecil & Thomas E. Willging, *The Use of Court-Appointed Experts in Federal Courts*, 78 JUDICATURE 38 (1994).

¹³⁶⁵ Jackson, G., Aitken, C. and Roberts, P., *Case assessment and interpretation of expert evidence. Guidance for judges, lawyers, forensic scientists and expert witnesses*, (4) PRACTITIONER GUIDE 4 (2015).

¹³⁶⁶ *Id.* at 6.

¹³⁶⁷ *Id.* at 7.

¹³⁶⁸ *Id.* at 9.

In Canada also, efforts are being made to educate judges and lawyers about special scientific techniques and science in general. The National Judicial Institute has taken the initiative to explore and educate scientific concepts that are likely to be used in litigations to groups of Canadian judges.¹³⁶⁹ Seminars were conducted on genetics and biotechnology by the Einstein Institute for Science Health and the Courts (EINSHAC). These efforts made to educate judges about scientific matters at least, if not more, help the judges gain familiarity with terminologies of science and methodologies of science. The judges are made aware of the latest technologies or scientific issues that may arise in litigation and thus, prepare them in advance for a better understanding of the issues. The benefits of building the foundation of scientific matters at the beginning of legal studies cannot be denied. But, as legal education continues to neglect the incorporation of basic science in law universities, such an effort to educate judges can be highly beneficial.¹³⁷⁰ These efforts have had an impact on legal education as well. The University of Montreal has a course dedicated to the use of science in courts. There is also a course on Law and Technology in Dalhousie. These courses are designed to teach law students proof of scientific issues. Similar efforts are being made in other universities also, like the course on medical liability in Osgoode Hall, the course on forensic science at the University of Ottawa, the course on qualitative methods at the University of B.C., the course on molecular biology, and the law in the Sherbrooke University, the course on law and medicine in the University of Windsor.¹³⁷¹

The Law Commission of India, in its 184th report, acknowledged that the nature of litigation and law practice in the country is undergoing a change as a result of globalisation.¹³⁷² The legal education shall also be changed accordingly to serve the needs of changing times. Interdisciplinary topics, such as law and society, law and technology, and law and management, need to be incorporated into the legal education. Respective courses ought to be introduced in law universities.¹³⁷³

¹³⁶⁹ Ian Binnie, *Science in the Courtroom: The Mouse That Roared*, 56 U.N.B.L.J. 307,322-323 (2007).

¹³⁷⁰ *Ibid.*

¹³⁷¹ *Ibid.*

¹³⁷² LAW COMMISSION OF INDIA, THE LEGAL EDUCATION & PROFESSIONAL TRAINING AND PROPOSALS FOR AMENDMENTS TO THE ADVOCATES ACT, 1961 AND THE UNIVERSITY GRANTS COMMISSION ACT, 1956 (184th report, 2003).

¹³⁷³ *Id.* at 59.

The Law Commission of India, in 1986, asserted that the knowledge of judges needs to be updated from time to time. The responsibility to ensure that judges are updated with the latest shall be solely imposed on judges themselves. It cannot be expected that judges read the latest literature themselves. The legal system as an institution has the responsibility to impart training to judges from time to time. Training is a potent tool to upgrade and sharpen the knowledge pool of judges.¹³⁷⁴

Section 7(1) of the Advocates Act, 1961, empowers the Bar Council of India to fix the standards of legal education together with the law universities. But this option may not be practically possible as to consult each and every university would be impractical for the Bar Council of India. The University Grants Commission also has the power to control and regulate the standard of education in all universities in India in general. It is suggested that University Grants Commission may constitute a committee dedicated to legal education in India.¹³⁷⁵ The Supreme Court, in the case of *Osmania University Teachers Association vs. State of A.P.*,¹³⁷⁶ has stated that University Grants Commission has a major role to play in giving shape to the education paradigm in the country and it shall not falter in its responsibility to maintain high standards.¹³⁷⁷ Certain law schools provide law students the opportunity to enrol in diplomas relating to medical jurisprudence and forensic science.¹³⁷⁸

At the same time, it is opined that imparting judges with scientific knowledge could be a flawed option in itself. *Christopher Onstott* (2007)¹³⁷⁹ argues that this solution may not be workable for the following reasons:

1. Judges lack the necessary scientific aptitude. It is argued that one of the reasons why people choose law as a profession is because they lack scientific aptitude or interest in science as a subject.

¹³⁷⁴ LAW COMMISSION OF INDIA, LAW RELATING TO ARREST 2 (117th report, 1986).

¹³⁷⁵ LAW COMMISSION OF INDIA, THE LEGAL EDUCATION & PROFESSIONAL TRAINING AND PROPOSALS FOR AMENDMENTS TO THE ADVOCATES ACT, 1961 AND THE UNIVERSITY GRANTS COMMISSION ACT, 1956 2-3(184th report, 2003).

¹³⁷⁶ AIR 1987 S.C. 2034.

¹³⁷⁷ LAW COMMISSION OF INDIA, THE LEGAL EDUCATION & PROFESSIONAL TRAINING AND PROPOSALS FOR AMENDMENTS TO THE ADVOCATES ACT, 1961 AND THE UNIVERSITY GRANTS COMMISSION ACT, 1956 14 (184th report, 2003).

¹³⁷⁸ ILS LAW COLLEGE, <https://ilslaw.edu/event/diploma-in-medical-jurisprudence-and-forensic-science/> (last visited Mar. 6, 2022).

¹³⁷⁹ Christopher Onstott, *Judicial Notice and the Law's Scientific Search for Truth*, 40 Akron L. Rev. 465,489 (2007).

2. There could be institutional resistance.
3. As scientific knowledge is getting highly specialised, the training to judge may prove to be fruitless.
4. Judges are very busy people. They would have time for scientific training.

These arguments seem to be superficial. The notion that law as a profession is chosen by people lacking interest in science is a mere old adage that has lost its meaning in today's world. Likewise, in present age, use science and technology is being welcomed and encouraged in all spheres of life. Hence no question of institutional resistance arises. The very purpose of forensic training for judges is to help them develop scientific aptitude. As regards the utility of training, it shall be clarified that purpose of training is not to turn judges into scientist. Also, it is not practically feasible to expect a judge to be as good as forensic experts. The limited purpose of judicial training in forensics is to prepare them and equip them with tools that would help them understand and assess scientific matters. Therefore, the arguments that imparting training to judges would be futile as they lack scientific aptitude, or because such matters are highly complicated, does not hold water. Further, it is unreasonable to presume that judges chose their profession only because they lack scientific aptitude. Infact, one of the participants (P6) of the study was a graduate with Bachelors of Science. This counters the argument that law is chosen as professional only by people who are not interest in science. The purpose of this study is to bring to lime light the urgency of scientific training of the judges. The participants have all spoken in favour of more training for judicial officers. The judicial system as an institution is meant to cater to the needs of the society most effectively. Once the need for more emphasis on training is clearly established and finds the support of judicial officers, institutional resistance is less likely to be there.

The law of evidence has provision for assistance from experts in order to overcome hindrances faced by judges in deciding technical questions as they lack scientific training or aptitude. The training imparted to judicial officers is meant for a limited purpose only.

5.5.3 SURVEY FINDINGS ON THE SCIENTIFIC LITERACY OF JUDGES

All the participants of the study categorically affirmed that judicial training in forensics is inadequate. The duration of the training, judges received at the time of joining the judicial academy ranges from 1 week to 15 days. This training includes visits to forensic labs and lectures from forensic experts. During the training judges are given notes and

reference material for future reference. All the participants found this training to be inadequate. The judges expressed their displeasure at the scant amount of training given to them. Certain responses from the participants are:

- “Training does not help. As at the time of training we have no practical experience.” (P1)
- “Technology is evolving faster than law. Refresher training hoti hai.¹³⁸⁰ But judges tend to forget also.” (P8)
- “Yes, more training is required. Atleast 2 or 2.5 months of training is required.” (P11)
- “Definitely there is need for training. Judges shall never stop learning.” (P13)

The responses of the participants indicate that not just the time duration but also the scheduling of the training is inappropriate. Judicial training is imparted in the first years after selection as a judicial officer. At this stage, judges have no experience in appreciating evidence. Some of the judges do not even have experience as litigating lawyers.¹³⁸¹ Just as some of the participants of the study had not practiced law in courts before selection as a judicial officer. The training given at the beginning of joining is devoid of practical experience. As mentioned by P1, training without practical exposure as a judge is futile.

Apart from the judicial training given at the time of induction, there are refresher courses organised to refresh the knowledge of judges. The frequency of these courses is once a year or once in two years Further, not all judges attend the refresher courses. Only a selected few are invited to attend the course. The frequency of refresher courses is also inadequate, as the participants mentioned that:

- “In Delhi, randomly judges are picked up every year for training in lab for 2 -3 days. So one person gets a chance once in 5-6 years.” (P1)
- “Refresher course can be there.” (P6)
- “Refresher courses shall be made compulsory every year.” (P10)

P4 stated that the training of investigating authorities is equally important. And much emphasis needs to be given to training the investigating officers as they have the first

¹³⁸⁰ Translation in English: “Refresher training does happen.”

¹³⁸¹ P1, P2, P3, P4, P7, P10, P11, P12 and P14.

encounter with the scene of a crime. The manner in which an investigating officer handles the evidence at the scene of the crime, like collection and preservation of evidence, has a great bearing on the outcome of the case.

- “Training is very much, but the training of judges is not fruitful unless there is more emphasis on training of investigation officers. Also, there is need to create more Forensic Science Labs.” (P4)
- “Moreover, the number of labs is very less. Things get delayed and losses worthiness because of delay, sample decomposition etc.” (P6)
- “There is need for training the IO more as judges only appreciate the evidence. The ground work is all done by IO.” (P12)

These responses clearly indicate the inadequacy of the training given to judges in forensics. The participants expressed concern about the inadequacy of training among judges as well as among the investigation officers. The lack of a sufficient number of laboratories is also a cause of concern as it causes delay in judicial processes.

5.6 RELUCTANCE TO USE COURT-APPOINTED/NEUTRAL EXPERTS

Experts are of two types.¹³⁸² Firstly, there are the experts called to court at the party’s request. Another type of experts are those experts who are summoned by the court.¹³⁸³ As described in chapter 3, the courts in most of the common law nations have the authority to appoint an expert for the help of the court. Some nations, such as the United States, have specific legal provisions for the appointment of experts by courts.¹³⁸⁴ Whereas, in certain countries, such as India, the courts have implicit authority to appoint an expert.¹³⁸⁵ Certain legislative provisions in India, in the context of specialised tribunals, expressly provide power to courts to appoint an independent scientific advisor.¹³⁸⁶

¹³⁸² *Amrit Raj (Minor), Through His Natural Guardian v. Dhawan Surgicary Care and Multi-Specialty Hospital*, Order dated 17.10.2019 by NCDRC, <https://indiankanoon.org/doc/45296223/> (last visited on Mar. 2, 2022).

¹³⁸³ *Ibid.*

¹³⁸⁴ Rule 706, FEDERAL RULES OF EVIDENCE.

¹³⁸⁵ *State (Delhi Admin.) v. Pali Ram*, (1979) 2 SCC 158.

¹³⁸⁶ S. 115, Patent Act, 1970 (39 of 1970); S. 4(2), National Green Tribunal Act, 2010 (No. 19 of 2010).

5.6.1 WAR OF EXPERTS

Historically, the court had the sole authority to summon experts to testify on matters that required expert knowledge. Consequently, the testimony of experts was, to a great extent, impartial.¹³⁸⁷ But with the advent of the adversarial revolution and opinion doctrine, expert witnesses emerged as a distinct legal entity.¹³⁸⁸ Courts in the late eighteenth century became neutral courtroom players. Litigants accepted the responsibility to bring their own evidence, including experts, to court.¹³⁸⁹ In those times, judges trusted the experts as men of science and trusted them to give unbiased opinions in courts.¹³⁹⁰ With the vast expansion of science, in the 19th century, there was a massive increase in the number of experts testifying in courts.¹³⁹¹ Expert acquired a central role in decision making by the courts.¹³⁹² This drastically changed the nature of expert testimony. Experts began to be manipulated by the parties hiring them as tools to further their interests. As a result, experts who were previously selected by the court and were considered to be part of the legal system lost their independence and impartiality. Members of the scientific community were pitted against one another as opposing sides' witnesses. As a result, the courts were confronted with conflicting expert testimony. Consequently, questions started to be raised about the credibility of expert testimony.¹³⁹³ Earlier, courts regarded experimental evidence as trustworthy. But, when courts heard expert testimony based on comparable experimental methodologies but with contradictory outcomes, it shook the trust of the judiciary. The court began to see experts as science's prostitutes, willing to jeopardise the integrity of their knowledge for financial gain.¹³⁹⁴ Thus, as the employment of experts in courts rose, judges started to see expert testimony as dubious.¹³⁹⁵ Experts gradually were seen as advocates for the side bringing them to court.¹³⁹⁶ Contradictory expert testimony, many a times, is not a result of the uncertainties inherent in scientific knowledge.¹³⁹⁷ Rather, it is a product of

¹³⁸⁷ Golan, Tal, *Revisiting the history of scientific expert testimony*, 73 BROOK. L. REV. 879, 885 (2007).

¹³⁸⁸ *Id.* at 884.

¹³⁸⁹ *Id.* at 885.

¹³⁹⁰ *Id.* at 903.

¹³⁹¹ *Id.* at 905.

¹³⁹² *Id.* at 904.

¹³⁹³ *Id.* at 905.

¹³⁹⁴ *Id.* at 909.

¹³⁹⁵ *Id.* at 909.

¹³⁹⁶ JAMES FITZJAMES STEPHEN, *A GENERAL VIEW OF THE CRIMINAL LAW OF ENGLAND* 189, 198-199 (London, MacMillan & Co., 2d ed. 1890).

¹³⁹⁷ Golan, Tal, *Revisiting the history of scientific expert testimony*, 73 BROOK. L. REV. 879, 913 (2007).

the adversarial character of judicial procedures.¹³⁹⁸ The problem of competing expert testimony gets more complicated when judges are unable to determine which of the two experts is correct. This problem may be rectified by appointing an impartial expert who is unaffected by partisan bias.¹³⁹⁹ Almost all researchers in the area agree with the proposal that courts should hire independent experts to resolve the problem of inconsistent expert testimony.¹⁴⁰⁰

As a result of the adversarial nature of the legal system, experts often turn partisan and the courtroom becomes a battleground for expert witnesses.¹⁴⁰¹ The High Court of Punjab and Haryana notes that handwriting experts engaged by a party, consciously or unconsciously, tend to give testimony in favour of the retaining party.¹⁴⁰²

1. It has been said that perhaps there is no kind of testimony more subject to bias in favour of the adducer than that of skilled witnesses.¹⁴⁰³ *Christopher* also suggests that a viable solution to the menace of partisan experts would be taking help from a neutral expert.¹⁴⁰⁴ The neutral scientific advisor can provide the court with non-party advice. It is believed that there would be less institutional resistance to this option if the report given by the neutral expert would be non-binding. This would ensure that the decision-making power is retained with judges only.¹⁴⁰⁵ Secondly, any mistake in decision yet made by both, the judge and the neutral expert, shall cause trust loss to a lesser extent.¹⁴⁰⁶ *Justin P. Murphy*¹⁴⁰⁷ has proposed setting up of a permanent body of specialised experts to help the judges combat the issue of reliability of the expert

¹³⁹⁸ *Id.* at 913.

¹³⁹⁹ David E. Bernstein, *The Misbegotten Judicial Resistance to the Daubert Revolution*, 89 NOTRE DAME L. REV. 27,69 (2013).

¹⁴⁰⁰ Golan, Tal, *Revisiting the history of scientific expert testimony*, (73) BROOK. L. REV. 879, 913 (2007); Solomon, Shana M., and Edward J. Hackett, *Setting boundaries between science and law: Lessons from Daubert v. Merrell Dow Pharmaceuticals, Inc.* 21(2) SCIENCE, TECHNOLOGY, & HUMAN VALUES 131,151 (1996); Lirienka Meintjes-Van der Walt, *The Presentation of Expert Evidence at Trials in*

South Africa, The Netherlands and England and Wales, (12) STELLENBOSCH L. REV. 283, 296 (2001).

¹⁴⁰¹ Solomon, Shana M., and Edward J. Hackett, *Setting boundaries between science and law: Lessons from Daubert v. Merrell Dow Pharmaceuticals, Inc.* 21(2) SCIENCE, TECHNOLOGY, & HUMAN VALUES 131,150 (1996).

¹⁴⁰² *State of Maharashtra v. Sukhdev Singh*, (1992) 3 SCC 700.

¹⁴⁰³ *Surat Singh v. State*, 1969 SCC OnLine P&H 206.

¹⁴⁰⁴ Christopher Onstott, *Judicial Notice and the Law's Scientific Search for Truth*, 40 AKRON L. REV. 489 (2007).

¹⁴⁰⁵ *Id.* at 490.

¹⁴⁰⁶ *Ibid.*

¹⁴⁰⁷ Justin P. Murphy, *Expert Witnesses at Trial: Where Are the Ethics*, 14 GEO. J. LEGAL ETHICS 217 (2000).

evidence. This body of experts can provide impartial assistance to the courts. They would cater to the court and not to one of the parties involved in the case. This body can provide the court with necessary resources and a pool of specialised experts from which the court can select one.¹⁴⁰⁸ The crucial element of this proposal is to provide courts with easy access to relevant experts who do not have a stake in the claim before the court.¹⁴⁰⁹ Separating the expert from the parties, will free the expert from the burden of pleasing the litigant who hires him and would permit the expert to focus mainly on their duty in the litigation, which is to utilise his or her expertise to analyse and explain the relevant issues to the judge objectively without any undue influence or pressure.¹⁴¹⁰ This would put a stop to the menace of “jukebox experts who sing the tunes they are paid for.”¹⁴¹¹ This would help in better assessing the reliability of expert evidence in the following ways-A neutral expert would have no stake in the case and thus would be able to objectively assist the court in comprehending complicated technical matters;

2. An independent expert would identify the crucial flaws in the testimony proffered by party experts in court, which is not possible for a non-scientifically trained judge or lawyer.
3. Experts chosen/hired by the litigants tend to exaggerate or suppress the scientific consensus as per convenience.¹⁴¹² Court-appointed experts are not tainted with partisanship and can help in identifying areas where there is little disagreement within the scientific community, thus narrowing the range of controversy.¹⁴¹³ The Punjab and Haryana High Court, in the case of *Chamkaur Singh v. Mithu Singh*,¹⁴¹⁴ noted that

the conflicting opinions from equal number of experts between two sides is a common scenario in our legal system. It was also held that the opinion of third government expert, which may be an independent opinion, may help

¹⁴⁰⁸ *Id.* at 236.

¹⁴⁰⁹ Joe S. Cecil & Thomas E. Willging, *The Use of Court-Appointed Experts in Federal Courts*, 78 JUDICATURE 41 (1994).

¹⁴¹⁰ Samuel Jackson, *Technical Advisors Deserve Equal Billing With Court Appointed Experts In Novel and Complex Scientific Cases: Does the Federal Judicial Center Agree?*, 28 ENVTL. L. 446 (1998).

¹⁴¹¹ Jeff Nesmith, *Science on Trial*, ATLANTA J. CONST., D4 (June 13, 1999).

¹⁴¹² Sheila Jasanoff, *What Judges Should Know About the Sociology of Science*, 32 JURIMETRICS J. 345, 358 (1992).

¹⁴¹³ Joseph Sanders, *Scientifically Complex Cases, Trial by Jury, and the Erosion of Adversarial Processes*, 48 DePaul L. Rev. 355, 378 (1999).

¹⁴¹⁴ *Chamkaur Singh v. Mithu Singh*, CR No.3434 of 2013, <https://indiankanoon.org/doc/7541953/> (last visited on Mar. 2, 2022).

the Court to break the stalemate and mitigate the conflict between the opinions of private experts giving conflicting opinions.

4. Additionally, the appointment of a neutral expert assists in crystallising the problems, shortens the duration of the hearing, saves the parties' money, and assists parties without the means to pay for experts.¹⁴¹⁵

It is important to refer, at this juncture, to a study done with respect to the National Green Tribunal of India (NGT) and the role played by the technical experts who are made part of the tribunal by virtue of the National Green Tribunal Act.¹⁴¹⁶ Clearly court-appointed experts have an advantage over the expert presented in courts by the litigating parties.¹⁴¹⁷ As a caution, court-appointed experts ought to be subjected to the same level of scrutiny and rigour as other experts.¹⁴¹⁸ The study found that the involvement of a technical expert in decision-making has yielded better results.¹⁴¹⁹

It would be prudent to take lessons from inquisitorial legal systems, in which experts are often selected by the court rather than the parties themselves.¹⁴²⁰ For instance, in a survey study with 144 judges in Sweden, it was found that judges tend to view court-appointed experts as more trustworthy than the party-appointed experts.¹⁴²¹

The benefits of court-appointed experts have been outlined in several rulings. In *Abbey National v. Key Surveyors*:¹⁴²² Sir Thomas Bingham MR noted that:

For whatever reason and whether consciously or unconsciously, the fact is that expert witnesses instructed on behalf of parties to litigation often tend, if called as witnesses at all, to espouse the cause of those instructing

¹⁴¹⁵ Lord Woolf, *Access to Justice Final Report to the Lord Chancellor on the Civil Justice System in England and Wales* (1996); Speaight, *Court Experts*, NEW L. J. 1770, 141 (1998).

¹⁴¹⁶ The National Green Tribunal Act 2010, the Gazette of India Extraordinary (No. 19 of 2010).

¹⁴¹⁷ Oren Perez, *Judicial Strategies for Reviewing Conflicting Expert Evidence: Biases, Heuristics, and Higher-Order Evidence*, 64 Am. J. Comp. L. 75,120 (2016).

¹⁴¹⁸ Derwin, Alexandra. *The judicial admission of flawed expert opinion evidence informing wrongful convictions*, 8 WJ LEGAL STUD. 1,13 (2018).

¹⁴¹⁹ Gitanjali Nain Gill, *Environmental Justice in India: The National Green Tribunal and Expert Members*, 5 TEL 175,175 (2016).

¹⁴²⁰ Solomon, Shana M., and Edward J. Hackett, *Setting boundaries between science and law: Lessons from Daubert v. Merrell Dow Pharmaceuticals, Inc.* 21(2) SCIENCE, TECHNOLOGY, & HUMAN VALUES 131,150 (1996).

¹⁴²¹ Friis, Eva, and Karsten Åström, *The Use of Court-and Party-Appointed Experts in Legal Proceedings in Sweden: Judges' Experiences and Attitudes*, 4(2) OSLO LAW REVIEW 63,74 (2017).

¹⁴²² [1996] 1WIR 1534 1547.

them to a lesser or greater extent, on occasion becoming more partisan than the parties. There must be at least a reasonable chance that an expert appointed by the court, with no axe to grind, but a clear obligation to make a clear and objective valuation, may prove a reliable source of expert opinion. If so, there must be a reasonable chance at least that such an opinion may lead to settlement of a number of valuation issues.

There are three approaches to the appointment of an expert by the court:¹⁴²³

1. A complete transfer of authority in technical matters by the judiciary to the experts. Such a specialised body of experts has been proposed for certain areas of law that are highly technical and science-driven. A suitable example would be patent cases.¹⁴²⁴
2. Neutral expert provides only additional information to the court and does not have any authority to decide the matter,¹⁴²⁵
3. Providing the court-appointed expert only with advisory authority and leaving to the judge the authority to finally decide the matter.¹⁴²⁶

5.6.2 EFFECT OF ADVERSARIALISM

Court-appointed experts provide the court with independent assistance.¹⁴²⁷ Yet, we see help from a neutral expert is rarely taken.¹⁴²⁸ In 1994 Federal Judicial Centre conducted an empirical study¹⁴²⁹ with around 100 judges in the U.S. centred on the question - why the court-appointed experts are not used so often. The study revealed that the reason for this was the judge's devotion to the adversarial system of litigation. And, the use of court-appointed experts is limited to exceptional cases only.

¹⁴²³ Harold L. Korn, *Fact, Law and Science in the Courts*, 66(6) COLUMBIA LAW REVIEW 1080,1080 (Jun., 1966).

¹⁴²⁴ Rifkind, *A Special Court for Patent Litigation? The Danger of a Specialized Judiciary*, 37 A.B.A.J. 425 (1951).

¹⁴²⁵ Webster & Hogeland, *The Economist in Chambers and in Court*, 12 A.B.A. ANTITRUST SECTION 50 (1958).

¹⁴²⁶ Kaysen, *An Economist as the Judge's Law Clerk in Sherman Act Cases*, 12 A.B.A. ANTITRUST SECTION 17-20.

¹⁴²⁷ REPORT TO THE PRESIDENT, FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE COMPARISON METHODS, 1,143 (Sep, 2016).

¹⁴²⁸ *Science and Technology in Judicial Decision Making Creating Opportunities and Meeting Challenges*, Report of the Carnegie Commission on Science, Technology and Government (March, 1993), at 26; Joe S. Cecil & Thomas E. Willging, *The Use of Court-Appointed Experts in Federal Courts*, 78 JUDICATURE 41 (1994).

¹⁴²⁹ Joe S. Cecil & Thomas E. Willging, *The Use of Court-Appointed Experts in Federal Courts*, 78 JUDICATURE 41 (1994).

The employment of a court-appointed expert is determined by the nature of the legal system. The employment of court-appointed experts is discouraged in common law countries because of the adversarial character of the judicial system. In an adversarial system, experts who are not nominated by the parties are distrusted.¹⁴³⁰ For instance, in the case of *Ashok Kumar Karan v. Satish Gupta*,¹⁴³¹ High court of Delhi held that –

In an adversarial litigating adjudicatory process, as followed in India, it is the duty of the respective parties to bring on record their evidence, and it is not the duty of a Court at a civil trial to direct evidence to be led in one form or the other. No doubt, in the interest of justice Courts have been vested with powers to summon evidence which is not being produced by the parties but that does not mean that in every case it is the duty of a Court to summon all and sundry evidence.¹⁴³²

In the inquisitorial legal system, the appointment of an expert by judges is a common phenomenon.¹⁴³³ Several arguments raised against the appointment of experts by the court are:

- a. The very neutrality of a court-appointed expert is being questioned, as "every expert comes to the court with an axe to grind."¹⁴³⁴ Factors such as culture, agenda of research funding, political affiliations etc., have a significant impact on the independence of expert findings.¹⁴³⁵ Mostly professional and scientific organisations support such testimony as is favourable to the industry that provides them with funds,¹⁴³⁶ whereas testimony in favour of consumers or environmental groups is

¹⁴³⁰ Lirienka Meintjes-Van der Walt, *The Presentation of Expert Evidence at Trials in South Africa, The Netherlands and England and Wales*, 12 STELLENBOSCH L. REV. 283,299-300 (2001).

¹⁴³¹ 2008 SCC OnLine Del 1087.

¹⁴³² *Id.*, para 24-25.

¹⁴³³ Solomon, Shana M., and Edward J. Hackett, *Setting boundaries between science and law: Lessons from Daubert v. Merrell Dow Pharmaceuticals, Inc.* 21(2) SCIENCE, TECHNOLOGY, & HUMAN VALUES 131,150 (1996).

¹⁴³⁴ Samuel Jackson, *Technical Advisors Deserve Equal Billing With Court Appointed Experts In Novel and Complex Scientific Cases: Does the Federal Judicial Center Agree?*, 28 ENVTL. L. 445 (1998).

¹⁴³⁵ Rebecca Eisenberg, *Academic Freedom and Academic Values in Sponsored Research*, 66 Tex. L. Rev. 1363, 1363 (1988).

¹⁴³⁶ MARCIA ANGELL, *SCIENCE ON TRIAL: THE CLASH OF MEDICAL EVIDENCE AND THE LAW IN THE BREAST IMPLANT CASE* (1996); Philip H. Abelson, *Toxic Terror: Phantom Risks*, 261 SCI. 407 (1993); Philip H. Abelson, *Pathological Growth of Regulations*, 260 SCI. 1859 (1993); Philip H. Abelson, *Risk Assessment of Low-Level Exposures*, 265 SCI. 1507 (1994).

discouraged.¹⁴³⁷ Experts so appointed are vulnerable to biases themselves.¹⁴³⁸ Though, strategy of averaging expert opinion may provide some relief in this context.¹⁴³⁹ It means that court by appointing experts with varying backgrounds may ensure that all possible opinions are presented to court.

- b. Appointment of an expert by court would undermine the adversarial legal system.¹⁴⁴⁰ The judges may get unduly influenced by the conclusions of “objective” experts and thereby give away the decisions making authority which is the exclusive domain of the judges only.¹⁴⁴¹
- c. This method would eliminate the diversity of scientific testimonies.¹⁴⁴² This argument holds no water as the appointment of an expert by court does not mean that parties cannot proffer expert evidence from their side. All the experts, including the party appointed expert, together may help the court resolve the technical matter in the case.
- d. Furthermore, judges would find it hard to appoint a competent expert.¹⁴⁴³ Appointment requires a clear understanding of the issue by the judge in the first place.¹⁴⁴⁴ Selection of experts by courts could be based on social connections and not on merits.¹⁴⁴⁵ There are ways and means for parties to keep a check on such malpractice. The party-appointed expert may highlight the issue before the appellate court.
- e. Appointing a court-appointed expert is seen to be an infringement on a party's right to control the evidence in the case.¹⁴⁴⁶ This argument is not sustainable. According to the European Court of Human Rights, evidence provided by an objective and independent expert does not violate an accused's right to a fair trial.¹⁴⁴⁷

¹⁴³⁷ Kapsa, Marilee M. and Meyer, Carl B. *Scientific Experts: Making Their Testimony More Reliable*, 35(2) CALIFORNIA WESTERN L. Rev. 317 (1999).

¹⁴³⁸ *Ibid.*

¹⁴³⁹ *Ibid.*

¹⁴⁴⁰ Samuel Jackson, *Technical Advisors Deserve Equal Billing With Court Appointed Experts In Novel and Complex Scientific Cases: Does the Federal Judicial Center Agree?*, 28 ENVTL. L. 444 (1998).

¹⁴⁴¹ *Id.*, at 445.

¹⁴⁴² Carl Meyer, *Science and Law: The Quest for the Neutral Expert: A View from the Trenches*, 13 J. NAT. RESOURCES AND ENVTL. L. 36 (1997).

¹⁴⁴³ Joe S. Cecil & Thomas E. Willging, *Court-Appointed Experts*, FEDERAL JUDICIAL CTR. 525,524 (1994).

¹⁴⁴⁴ Oren Perez, *Judicial Strategies for Reviewing Conflicting Expert Evidence: Biases, Heuristics, and Higher-Order Evidence*, 64 Am. J. Comp. L. 75,109 (2016).

¹⁴⁴⁵ *Id.* at 103.

¹⁴⁴⁶ Golan, Tal. *Revisiting the history of scientific expert testimony*, 73 Brook. L. Rev. 879,914 (2007).

¹⁴⁴⁷ *Btdnisch v Austria*, ECHR 6 May 1985 series A No 92 J 1989 385; *Brandsletler v Austria*, ECHR 28 August 1991 series A No 211 NJCM-Bulletin 173 [1992].

As far as the subjectivity of an expert is concerned, it is an inevitable part of human nature. All human beings are bound to have an element of subjectivity in the way they carry out their work. A court-appointed expert being a human is bound to have certain prejudices and bias. But, a court-appointed expert would be free from the bias that results from being associated with one of the parties to the litigation. As regards the second objection that judges may lean more in favour of a court-appointed expert, it is submitted that the undue reliance on court-appointed can be cross-checked by parties producing their own expert to court. The litigating parties always have the option of bringing their own expert to court. And, thus present all possible views to the court. The judge would have to explain in the judgment why the report of either expert was preferred over the other. In this way, the court would not be able to set aside the report of a party-appointed expert merely because it is not conceived as independent. As regards the difficulty in the appointment of experts, this is a procedural aspect, and a solution to this can be worked out with the help of court administrating staff.

*Tahirih*¹⁴⁴⁸ propagates that the wide use of court-appointed experts can decrease the problem relating to partisan experts. A judge is the only courtroom player in litigation who can appoint an expert that gives supplementary and unbiased assistance to the court. The author has given some common sense based theoretical reasons for the courts' reluctance to make use of a neutral expert in the U.S. under 706 of the Federal Rule of Evidence. One of the reasons stated by the author is fear of diluting the adversarial nature of the court proceedings. Another reason cited is that this may lead to a compromise with the judge's objectivity. It means that they fear that judges may lose their impartiality towards the parties. Unwillingness to devote time and resources is also cited as one of the factors.

*Murphy*¹⁴⁴⁹ suggests that the supervision and control by the trial court will control the use of the court-appointed experts and save them from any influence from any other agency, financial or political. Furthermore, there is no need to rely solely on the role of the adversarial process in the courts search for truth.¹⁴⁵⁰ An opinion of the neutral expert may be shared with the concerned parties thus, the adversarial system will not be undermined.

¹⁴⁴⁸ Tahirih V. Lee, *Court-Appointed Experts and Judicial Reluctance: A Proposal to Amend Rule 706 of the FRE*, 6 YALE L. & POL'Y REV. 480 (1988).

¹⁴⁴⁹ Richard Glover & Peter Murphy, *Murphy on Evidence* 3 (13th ed., 2013).

¹⁴⁵⁰ Samuel Jackson, *Technical Advisors Deserve Equal Billing With Court Appointed Experts In Novel and Complex Scientific Cases: Does the Federal Judicial Center Agree?*, 28 Env'tl. L. 445 (1998).

This will only promote merit-based decisions and more reasoned decisions. Also, the adversarial process works to prevent a proper assessment of scientific issues as it leads parties to "produce evidence favourable to their respective sides, regardless of the quality of that science."¹⁴⁵¹ This, in turn, results in a "battle of the experts".¹⁴⁵² The real picture with respect to a forensic technique in question never reaches the courtroom or is blurred. Consequently, "the adversarial process will not necessarily produce a full spectrum of scientific research on a particular topic, making it very different from the formal and informal consensus-building methods that science itself uses."¹⁴⁵³ These issues may get multiplied as law graduates lack scientific training and would not be in a position to ask appropriate probing questions.¹⁴⁵⁴

After the *Daubert* decision, it was believed that it would be suitable to distinguish between valid and invalid scientific conclusions. However, this has been made less likely by the adversarial system.¹⁴⁵⁵ As Michael Saks and Roselle Wissler put it:

The search for witnesses that is driven by the adversary process may result in a distortion of knowledge when applied to expert witnesses. For example, if 999 of every 1000 experts in a given field hold one view of a question and one holds an alternate view, the two experts who appear in court will have been detached from the extremely skewed distribution of opinion from which they were drawn. The fact finder has no way of knowing this.¹⁴⁵⁶

The very fact that *Daubert* trilogy i.e., *Daubert*, *Joiner* and *Kumho* decisions put the responsibility of assessing the reliability of expert testimony on trial judges, presupposes that adversarial process are not sufficient to elicit out bias and inaccuracies in the testimony given by experts in courts.¹⁴⁵⁷ Forensic community have some adverse

¹⁴⁵¹ Emily Hammond Meazell, *Scientific Avoidance: Toward More Principled Judicial Review of Legislative Science*, 84 IND. L.J. 239 (2009).

¹⁴⁵² *Ibid.*

¹⁴⁵³ *Ibid.*

¹⁴⁵⁴ *Id.* at 255.

¹⁴⁵⁵ Joseph Sanders, *Scientifically Complex Cases, Trial by Jury, and the Erosion of Adversarial Processes*, 48 DEPAUL L. REV. 355,374 (1999).

¹⁴⁵⁶ Michael J. Saks & Roselle L. Wissler, *Legal and Psychological Bases of Expert Testimony: Surveys of the Law and of Jurors*, 2 BEHAV. SCI. & L. 435, 439-40 (1984).

¹⁴⁵⁷ Kapsa, Marilee M. and Meyer, Carl B, *Scientific Experts: Making Their Testimony More Reliable*, 35(2) CALIFORNIA WESTERN LAW REVIEW 319 (1999).

comments to make about the adversarial system. Prof, Coady notes that "the adversary system is probably the best tool we have for detecting... [overconfidence, self-deception, and dishonesty] ... though, ironically, it is itself responsible for one common defect, namely, the expert's temptation to identify overmuch with the cause of his 'side.'"¹⁴⁵⁸ Garrett¹⁴⁵⁹ states that the adversarial system has been an utter failure to keep invalid testimonies away from courtrooms. Also, when invalid forensic evidence is challenged in courts, judges hardly provide relief. For instance, evidence such as ballistics and fingerprints, have been challenged numerous times in courts. Yet, the courts have permitted the use of this evidence without limit.¹⁴⁶⁰ Thus the contention that adversarial tools and mechanisms are sufficient to bring out the truth of expert testimony is without merit and ought to be rejected.

Moreover, provisions such as section 165 of the Indian Evidence Act 1872, have been enacted to overcome the shortcomings of the adversarial system by giving the court authority to act proactively. The section envisages that the judge shall become an active and participating member of the court.¹⁴⁶¹ The Supreme Court of India has held that "it is the duty of a presiding judge to explore every avenue open to him in order to discover the truth and to advance the cause of justice."

5.6.3 SURVEY FINDINGS ON USE OF COURT-APPOINTED EXPERT

The appointment of a neutral expert by court is, by implication, a component of an effective gatekeeping duty of the courts. It is a technique for managing and controlling the production of evidence in court. This is precisely why a comprehensive study concerning gatekeeping function shall cover issues relating to court-appointed expert. In light of the above literature, participants of the survey were asked questions relating to the appointment of expert evidence. To be specific, judges were asked: When do you think that court shall appoint a neutral expert? How often do you think neutral experts are employed? Have you ever come across a situation where there are contrary opinions

¹⁴⁵⁸ Richard H. Underwood, *Evaluating Scientific and Forensic Evidence*, 24 AM. J. TRIAL ADVOC. 149,168 (2000).

¹⁴⁵⁹ Garrett, B.L. and Neufeld, P.J., *Invalid forensic science testimony and wrongful convictions*, VIRGINIA LAW REVIEW 1,10 (2009).

¹⁴⁶⁰ Mnookin, J.L., *The courts, the NAS, and the future of forensic science*, 74(4) BROOKLYN LAW REVIEW 10 (2010).

¹⁴⁶¹ *Ram Chander v. State of Haryana*, (1981) 3 SCC 191.

given by experts of parties from both sides? How do you resolve this? What do you do when none of the parties proffer expert evidence?

The majority of the judges, i.e., 15 participants, were of the opinion that the appointment of a neutral expert shall be based on the factual situation of the case. For instance, P2 mentioned that in civil cases, the court does not indulge in the exercise of appointing a neutral expert, but in criminal cases, the court may send the evidence to government forensic laboratory for examination if required. These participants stated that it was the discretion of the judge to decide if the circumstances were such that a neutral expert shall be appointed. Most interestingly, the participants of the study equated government forensic laboratories with neutral experts. P2 clearly mentioned that the court never goes beyond FSL (Forensic Science Laboratory). The following responses make it abundantly clear that neutral experts for judges meant government forensic laboratories.

- “FSL is over-burdened. The case would get delayed.” (P3)
- “Definitely, the court has power to appoint expert. Example, in 138 NI cases, parties hire experts. Many a times those reports are disputed, by the opposing counsel. And, it is prayed that sample be sent to government approved FSL. They are assumed to be unbiased, unless proved otherwise.” (P5)
- “CFSL has work load and availability issues. They are overly burdened. It takes years to get a report from them. They do the important or urgent cases first.” (P9)

At the same time, 5 participants categorically stated that courts have no authority to appoint neutral experts.¹⁴⁶² They opined that only parties can bring evidence to the court, and the court did not have the authority to produce evidence. Though the other 15 participants agreed that the power to appoint a neutral expert resides with the court, in actual practice only 6 participants had exercised this option.¹⁴⁶³

Judges were asked how they would handle such a situation when neither party presented expert evidence or when the experts gave contradictory opinions. 16 judges had encountered such scenarios, whereas four judges¹⁴⁶⁴ said that this had not occurred in

¹⁴⁶² P2, P6, P18, P19 and P20.

¹⁴⁶³ P1, P5, P8, P10, P12 and P16.

¹⁴⁶⁴ P6, P12, P13 and P17.

their courts. Those who lacked such practical expertise were asked to provide hypothetical responses. Majority of judges (12 participants)¹⁴⁶⁵ said that they would determine the issue on the basis of other evidence submitted to the court rather than refer the matter to a neutral expert for examination. The other participants gave the following responses:

- “Neutral Expert which is FSL.” (P1)
- “Credentials, if credentials same, then we see what is appealing to us. What is logically more correct. Who has between arrived at the conclusion. And not jumped at the conclusion.” (P3)
- “Yes, certain aspects shall be left to the experts only. In order to pass a decision, a judge shall own his decision. Therefore, to be sure, sample shall be sent to FSL. This is an individual call.” (P5)
- “The course of action would depend on the nature of the case, and the nature of the accusation, if it involves serious offences like murder, rape the court would act more proactively.” (P12)

Thus, only a few judges were inclined to refer the matter to a neutral expert in cases where there is contradictory expert opinion or no expert evidence. To sum up, it is evident that courts appoint experts less often. The literature has highlighted the advantages of appointing an impartial expert. However, this option is seldom exercised in reality. The courts prefer that parties present evidence to the court in accordance with their interests. Interestingly, the current research's results are very comparable to those of another similar study by *Dobbin*.¹⁴⁶⁶ The central issue that this study was concerned with was whether, in the U.S., the problems related to expert evidence encountered by state trial court judges were the same as those encountered by the federal judges. It focuses on the strategies that judges may employ to manage the proffer and presentation of expert evidence. This study also found that judges tended to prefer to delegate evidence handling to the parties in virtually all situations.

¹⁴⁶⁵ P4, P5, P7, P9, P10, P11, P14, P15, P16, P18, P19 and P20.

¹⁴⁶⁶ Dobbin, Shirley A., et al., *Federal and state trial judges on the proffer and presentation of expert evidence*, 28(1) JUST. SYSTEM J. 1-15 (2007).

5.7 CONCLUSION

The analysis of the responses of the judges has made it abundantly clear that Indian jurisprudence and legal practices are fraught with vices, such as a lack of scientific training of judges or legal education being devoid of courses on forensic or scientific subjects. Scientific illiteracy could be overcome to some extent by the use of a court-appointed expert. Unfortunately, this option is not opted for by judges in general. All the participants, who are all judges in trial courts in New Delhi, have unanimously acknowledged the dearth of training on scientific matters. As a consequence of inadequate training and non-use of court-appointed experts, the sole guide or legal guideline available to judges is to consider forensic evidence as corroborative evidence only. It is believed that a judge shall be cautious and prudent not to use forensic evidence in the absence of corroborative evidence. There seems to be no other tool for the evaluation of forensic evidence. And, even the rule requiring corroboration is bypassed in relation to techniques that the judge considers as accurate.

Moreover, a perception that forensic evidence are only corroborative evidence has led judges to give more credence to direct evidence. Whereas there have been many cases where lapses in direct evidence have led to wrongful convictions. And those errors were later rectified with the help of forensic evidence.¹⁴⁶⁷

¹⁴⁶⁷ Namita Bajpai, *Falsely accused of Rape, U.P. man freed after spending 20 years in jail*, THE NEW INDIAN EXPRESS, Mar. 3, 2021, <https://www.newindianexpress.com/nation/2021/mar/03/falsely-accused-of-rape-up-man-freed-after-spending20-years-in-jail-2271749.html> (last visited Mar. 5, 2022).

6.0 ANALYSIS OF JUDGE'S EXPERIENCE WITH ASSESSMENT OF FORENSIC EVIDENCE (PART II)

6.1 INTRODUCTION

This chapter is the continuation of chapter 5. For the sake of presenting the results of the qualitative research with judges in a more ordered and defined way, the discussion of the findings has been separated into two chapters. Section 5.1, introduction to chapter 5, explains the objective of both chapter 4 and 5. The study of the findings revealed distinct themes and trends. Some of the themes have been mentioned in chapter 5. The remainder is being dealt with in this chapter. The themes covered in this chapter are: acknowledgment of the gatekeeping function (section 6.2), application of *Daubert* in court (section 6.3), judicial assessment of forensic evidence (section 6.3), and tools used for evaluation of forensic evidence (section 6.4).

6.2 EXPERT DEPOSES, JUDGE DECIDES

The importance of a judge's gatekeeping role cannot be overstated. It is a critical component of judicial decision-making and an integral feature of most of common law jurisdictions, including India. As mentioned in Chapter 3, all common law countries need judges to bear this obligation. Though there are dissimilarities in the legal systems of these countries, one thing that all countries agree on is that the final duty for evaluating expert evidence rests with a judge. It is worthwhile to reiterate that gatekeeping refers to the obligation of a judicial official to ensure that the evidence produced in courts adheres to the standards of admissibility as per the rules and regulations of the jurisdiction to which the court belongs.¹⁴⁶⁸

The manner in which a judge performs the gatekeeping task is often critical to the case's eventual resolution.¹⁴⁶⁹ Acceptance of incriminating forensic evidence at trial may have a significant impact on whether the defendant is convicted or acquitted.¹⁴⁷⁰ Additionally,

¹⁴⁶⁸ Mara L. Merlino, Colleen I. Murray & James T. Richardson, *Judicial gatekeeping and the social construction of the admissibility of expert testimony*, 26 BEHAV. Sci. & L. 187,187 (2008).

¹⁴⁶⁹ *Re. Court on its own motion, State (GNCT) of Delhi v. Siddhartha Vashisht* 85 2013 (201) DLT 657; 2013(3) RCR (Criminal) 417, para 92.

¹⁴⁷⁰ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,2 (2021).

the decision to admit erroneous evidence could lead to wrongful convictions.¹⁴⁷¹ Derwin,¹⁴⁷² in the context of Canada, claims that erroneous decisions in the case of *Mullins-Johnson* and *Broomfield* trials could have been avoided if the gatekeeping function was properly executed. In short, for the rightful administration of justice, it is a prime duty of a judge to evaluate the reliability and probative worth of an expert's testimony correctly, keeping in view the accepted legal standards.¹⁴⁷³ A judge shall make evidentiary decisions with caution, cross-checking and good judicial conscience.¹⁴⁷⁴ All efforts must be made to avoid pitfalls, errors, or wrongful decisions.¹⁴⁷⁵ Reliability refers to trustworthiness or dependability.¹⁴⁷⁶ In relative terms, an evidence is more reliable than all other evidence, if it is more trustworthy than other pieces of evidence.¹⁴⁷⁷ The main concern behind reliability assessment is to check the *veritistic* property of expert evidence.¹⁴⁷⁸ *Veritistic* refers to the ability to produce truth.¹⁴⁷⁹ It is the *veritistic* quality of evidence that shall determine the accurateness of a judicial decision.¹⁴⁸⁰

The survey's results indicate that judges have a clear understanding of their responsibilities regarding forensic evidence. They fully acknowledge that it is the judge's responsibility to evaluate the forensic evidence and not to blindly rely on the expert's findings. The opinion of an expert does not become the opinion of the court unless it is accepted by the court.¹⁴⁸¹ In order to find out about the perception of judges regarding their gatekeeping function, the judges were asked the following two questions. Firstly, what is the role of a judge with respect to forensic evidence? Secondly, do you see the role of the judge as 'gatekeeper' as an appropriate one?

The responses to the first question demonstrate unequivocally that judges are well aware of their responsibilities to assess the forensic evidence's true probative value. Though

¹⁴⁷¹ Derwin, A., *The judicial admission of flawed expert opinion evidence informing wrongful convictions*, 8(2) *Western Journal of Legal Studies* 1,1 (2018).

¹⁴⁷² *Ibid.*

¹⁴⁷³ *S.J. Chowdhary v. CBI*, 2010 (6) RCR (Cr.) 3099, para 187.

¹⁴⁷⁴ *Ibid.*

¹⁴⁷⁵ *Ibid.*

¹⁴⁷⁶ Dale A. Nance, *Reliability and the Admissibility of Experts*, 34 Seton HALL L. REV. 191,219 (2003).

¹⁴⁷⁷ *Id.* at 219.

¹⁴⁷⁸ *Id.* at 194.

¹⁴⁷⁹ *Id.* at 194.

¹⁴⁸⁰ *Id.* at 194.

¹⁴⁸¹ *Madan Gopal Kakkad vs. Naval Dubey and Ors.*, MANU/SC/0509/1992; Mara L. Merlino, Colleen I. Murray & James T. Richardson, *Judicial gatekeeping and the social construction of the admissibility of expert testimony*, 26 BEHAV. Sci. & L. 187,188 (2008).

none of them were familiar with the technical phrase 'gatekeeping.' Nonetheless, it was reassuring to learn that judges are all acutely conscious of their role as gatekeepers. The following are excerpts from remarks made by the participants of the study.

- “Judges have the discretion to rely on forensic evidence or not. General perception is that forensic evidence are highly reliable and, therefore, are not negated readily.” (P1)
- “The ultimate decision is that of the judge. Whether or not to go by the expert report. A judge has to see how the expert has arrived at a particular conclusion. whether some procedure was followed or not. Judge shall see if the expert has actually arrived at a conclusion and not jumped at the conclusion. There shall be logical basis for his conclusion. But judges do not have the training as much as experts do. So, what the judge is able to do is to whether the report has a logical foundation or not. This is what role of a judge is in relation to expert evidence. So, the report may be based on science, but the decision of the court shall be based on logic. Whether the expert report is logical or not.” (P3)
- “Judge's role is to give his opinion and to find out how reliable the evidence is.” (P4)
- “Judge has to see if the evidence is tutored or not.” (P10)
- “To give due weightage to the evidence keeping in mind many factors.” (P11)
- “To remain updated with the latest knowledge.” (P12)
- “Judge has to analyse knowledge and opinion of the expert. There is not much different in direct and forensic evidence, in both, judge has to apply his judicial acumen and see the reliability.” (P13)
- “Court is the expert of all experts.” (P14)
- “Like other evidences the court decides the weight of forensic evidence as well.” (P15)
- “Court decides the weight of forensic evidence.” (P18)
- “The court shall examine the expert report before it relied on it.” (P19)
- “Expert deposes and the court decides.” (P20)

One of the judges mentioned that the court is the expert of all experts. Thus, the ultimate responsibility lies on the shoulders of a judge to see if the expert opinion is worthy of

being considered by the court. The phrase ‘court is expert of all experts’ is often used in cases concerning handwriting experts.¹⁴⁸² The High Court of Kerala has held that this phrase is a judicial concept, and there are certain limitations and constraints that a court has to face as a non-expert.¹⁴⁸³

Use of the terms, such as ‘discretion of the judge’, “ultimate decision is that of the judge”, “court decides”, “judge has to see”, “apply judicial acumen” etc., point towards a clear understanding among judges that forensic evidence shall be examined by the concerned judicial officer. Further, the responses of the participants illustrate that the examination of the forensic evidence shall relate to the “weightage”, “weight”, “reliability”, “logical basis”, “manner in which the conclusion has been arrived at”, “tutored or not.” Thus, it can be concluded that the participants of the study acknowledged that the assessment of the forensic evidence for its reliability and probative worth is their responsibility. The fact that none of the participants were aware of the term ‘gatekeeping’ loses its significance when, in practice, the gatekeeping role is well-appreciated by the judges. P3 elaborated on the role of a judge qua forensic evidence in a lucid manner. He explained that the court shall see whether the conclusion in the forensic report has been arrived at or the expert has jumped to the conclusion. The difference between the two terms, “arrive at a conclusion” and “jump to a conclusion,” is highly consequential. The participant clarified that a conclusion is arrived at when there is a logical basis for coming to that particular conclusion. Though the use of logic for the evaluation of forensic evidence is contested in Section 5.4 of this chapter. Yet, the remarks by the participants are helpful in establishing that the gatekeeping function, in essence, is recognised by the judges. Observing and acknowledging the gatekeeping role is one thing, but carrying out the duty of the gatekeeper effectively is quite another. The adoption and upholding of judges’ gatekeeping duty is covered in this section. Sections 5.4 and 5.5 have discussed the method for performing this task.

¹⁴⁸² *Basudeo Narain Sinha v. State of Bihar*, 2007 SCC OnLine Pat 266; *Tapan Kar v. State of West Bengal*, 2006 SCC OnLine Cal 513; *Santi Rani Patra v. Swapan Kumar Roy*, 2018 SCC OnLine Cal 11203; *Sandhya Guha Roy v. Supriya Bose*, 2010 SCC OnLine Cal 1977.

¹⁴⁸³ *Akhil v. Kerala State Road Transport Corporation*, 2014 SCC OnLine Ker 22988, para 7.

6.3 DAUBERT – UNKNOWN ENTITY

The Supreme Court and High Courts in India have referred to *Daubert* repeatedly. But, the reference to the judgment has been just perfunctory or superficial. Such a reference cannot be claimed to be laying down a proposition of law.¹⁴⁸⁴ The Madras High court, in the case of *State v. Rajaram*,¹⁴⁸⁵ has stated that the Supreme Court in *Ranjitsing Brahmajeetsing Sharma*¹⁴⁸⁶ “had merely quoted the test and had not laid down any proposition of law.” There are other judgments that have made a passing reference to *Daubert* without actually applying to the facts of the case.¹⁴⁸⁷ Some courts have referred to the *Daubert* judgment for reasons other than the admissibility test laid down in the judgments, such as, on the point that scientific knowledge is uncertain in nature.¹⁴⁸⁸ Whereas, there are judgments that have referred to *Daubert* to emphasise that the gatekeeping function of a trial judge includes ensuring that the evidence is not just relevant but also reliable.¹⁴⁸⁹ Thus, there are no judgments in India wherein the *Daubert* test has actually been applied. Mere reference to the judgment without an actual application of the admissibility standards appears to be the result of the absence of standards or guidelines concerning the evaluation of expert evidence in India. The High Court of Uttarakhand in the case of *State of Uttarakhand v. Akhtar Ali*¹⁴⁹⁰ referred to Rule 702 of the Federal Rules of Evidence, Frye, and *Daubert*. But eventually the court held that

No rules of evidence, as such, are in force in this country for accepting the expert evidence. It all rests upon the prosecutor as to how he introduces the expert? How he proceeds with the testimony of the expert? And, of course, it also depends upon the presiding judge, as to how he ensures that truth is not suppressed.

¹⁴⁸⁴ *State v. Rajaram*, Madras HC (2009) para 159(v)(c), <https://indiankanoon.org/doc/84858021/> (last visited Nov. 3rd, 2022).

¹⁴⁸⁵ *Ibid.*

¹⁴⁸⁶ *Ranjitsing Brahmajeetsing Sharma v. State of Maharashtra*, (2005) 5 SCC 294.

¹⁴⁸⁷ *Selvi v. State of Karnataka*, (2010) 7 SCC 263; *Ranjitsing Brahmajeetsing Sharma v. State of Maharashtra*, (2005) 5 SCC 294; *Mukesh v. State (NCT of Delhi)*, (2017) 6 SCC 1; *Jaga Arjan Dangar v. State of Gujarat*, 2018 SCC OnLine Guj 4799; *Dharam Deo Yadav v. State of U.P.*, (2014) 5 SCC 509.

¹⁴⁸⁸ *A.P. Pollution Control Board v. Prof. M.V. Nayudu*, (1999) 2 SCC 718.

¹⁴⁸⁹ *Nnadi K. Iheanyi v. Narcotics Control Bureau*, 2014 SCC OnLine Del 4537; *Rohit Shekhar v. Narayan Dutt Tiwari*, 2011 SCC OnLine Del 4076; *Harjinder Kaur v. State of Punjab*, 2012 SCC OnLine P&H 13445.

¹⁴⁹⁰ 2019 SCC OnLine Utt 1558, para 76.

The high court even admonished the lower court for merely quoting the few parameters of the test laid down in *Daubert* without answering any of them. The high court held that such a mechanical reference is not legally warranted.

Thus, the application of *Daubert* in practice is absent in Indian jurisprudence. Unfortunately, the courts in India have not formulated a standard or guideline for evaluating the reliability of forensic evidence.¹⁴⁹¹ Whenever a question of reliability standards arises, and the courts merely refer to *Daubert* for reference's sake. The overall result of this void in Indian jurisprudence could be pernicious. The judicial approach in relation to scientific evidence has been inconsistent and vague. The courts rarely stress the requirement to adopt a rational and scientifically justifiable approach for the vetting of forensic evidence.¹⁴⁹²

The survey participants were asked questions about their perspective on the implementation of *Daubert* as a reliability criterion. It was not surprising to discover that none of the participants were familiar with *Daubert*. After being informed, eight participants asserted that if the Supreme Court relied on the *Daubert* decision, courts are free to use the *Daubert* standard.¹⁴⁹³

Thus, it is safe to say that *Daubert* has not been adopted by Indian courts in essence. Consequently, there is a dearth of guidance and standards for keeping a check on unreliable and faulty forensic expert testimonies.

There is little doubt that the *Daubert* factors and the *Daubert* judgment have revolutionised the establishment of admissions standards in many parts of the world, as discussed in chapter 3. The decision has had a significant impact on academic debates in common law countries regarding the admissibility of evidence. The *Daubert* decision was handed down in 1993, so it's been more than three decades. However, the significance of the ruling has only grown with time. As a matter of fact, it's more crucial

¹⁴⁹¹ NLUJ LR, *Faulty Foundations: A Socio-Legal Critique of the Regulation of Forensic Science Laboratories in India*, 191,237 (2021).

¹⁴⁹² *Id.* at 238.

¹⁴⁹³ P3, P4, P8, P9, P10, P11, P12 and P16.

now than it was in 1993, as significant breakthroughs in forensic science over the past decade have altered the way criminal investigations and trials are handled.¹⁴⁹⁴

Irrespective of their philosophical orientation, all judges must act as judicial gatekeepers and protect the courtroom from untrustworthy expert testimony.¹⁴⁹⁵ With the aid of *Daubert*, the court is better placed to assess evidence.¹⁴⁹⁶ Since the *Daubert* decision, the courts have been cognizant that they should not accept expert testimony just because other courts have done so in the past on the basis of *stare decisis*.¹⁴⁹⁷ Well-known law professor *David Owen* points out that *Daubert* has played a key role in keeping bogus science out of court in product liability claims in the U.S. federal courts, particularly in situations where an expert witness is an important piece of evidence.¹⁴⁹⁸ The *Daubert* has had the effect of highlighting the importance of judges as gatekeepers.¹⁴⁹⁹ After *Daubert* judges have been more aware of their responsibilities, they have been extra cautious while carrying out their duties.¹⁵⁰⁰

Due to the enormous advantages of *Daubert* standards and principles, legislation was enacted in 2013 in Florida to implement *Daubert* and replace the *Frye* Standards.¹⁵⁰¹ *Daubert's* technique is thought to be scientific, allowing for the presentation of only credible expert evidence in court.¹⁵⁰² The *Daubert* standard for admission places a premium on the 'principles and methods' behind expert testimony.¹⁵⁰³ The *Daubert* test is not concerned with the expert's judgment or conclusions.¹⁵⁰⁴ Another advantage of

¹⁴⁹⁴ Schwartz, Victor E. and Silverman, *The Draining of Daubert and the Recidivism of Junk Science in Federal and State Courts*" 35(1) HOFSTRA LAW REVIEW 219 (2006); Donald E. Shelton, *Twenty-First Century Forensic Science Challenges for Trial Judges in Criminal Cases: Where the Polybutadiene Meets the Bitumen*, 18 WIDENER L.J. 309,395 (2009).

¹⁴⁹⁵ Schwartz, Victor E. and Silverman, *The Draining of Daubert and the Recidivism of Junk Science in Federal and State Courts*" 35(1) HOFSTRA LAW REVIEW 219 (2006).

¹⁴⁹⁶ *Id.* at 230.

¹⁴⁹⁷ *Id.* at 230.

¹⁴⁹⁸ David G. Owen, *A Decade of Daubert*, 80 DENVER UNIV. L. REV. 345, 362 (2002).

¹⁴⁹⁹ *Ibid.*

¹⁵⁰⁰ *Ibid.*

¹⁵⁰¹ Michael J. DeCandio, *From Frye to Daubert what you need to know about admitting expert testimony in Florida State Courts*, Marshall Dennehey (Dec. 17th, 2013), <https://marshalldennehey.com/articles/frye-Daubert-what-you-need-know-about-admitting-expert-testimony-florida-state-courts> (last visited Nov. 18th, 2022). (for all internet sources, indicate the author, the title of the issue, the web address and the date of access)

¹⁵⁰² *Ibid.*

¹⁵⁰³ *Ibid.*

¹⁵⁰⁴ *Ibid.*

adopting *Daubert* is that it is applicable to all forensic techniques, whether novel or established.¹⁵⁰⁵

In a mail survey of District Court judges in the U.S., it was discovered that judges were more likely in 1998 than in 1991 to scrutinize expert evidence at the pre-trial stage before admitting it.¹⁵⁰⁶ Even the quantity of challenges brought against expert evidence by the advocates has grown after the adoption of *Daubert*.¹⁵⁰⁷ This is indicative of the significance of *Daubert* with respect to the admission of expert evidence in courts.

According to *Fredella*, *Daubert* has been used successfully and consistently in cases involving pure sciences such as physics, biology, pathology, and forensic engineering.¹⁵⁰⁸ However, courts have found it difficult to apply *Daubert* to areas that are more technical than scientific.¹⁵⁰⁹ This difficulty occurred when *Daubert* standards were expanded to include all technical evidence, such as forensic accounting and handwriting.¹⁵¹⁰ Nonetheless, courts have generally done a good job of eliminating faulty expert testimony with the assistance of *Daubert*.¹⁵¹¹ There is empirical evidence that judges' understanding of 'junk' science has risen with the advent of *Daubert*, and that expert testimony is evaluated with care and diligence.¹⁵¹² It is claimed that by adopting and using standards such as *Daubert*, the general quality and reliability of expert testimony may be enhanced. The court might be shielded from relying on faulty expert testimony, thus eliminating the risk of wrongful convictions.¹⁵¹³

¹⁵⁰⁵ *Ibid.*

¹⁵⁰⁶ Treadway-Johnson, M., C. Krafka, and J. Cecil, *Expert Testimony in Federal Civil Trials: A Preliminary Analysis*, WASHINGTON, DC: FEDERAL JUDICIAL CENTER 1 (2000).

¹⁵⁰⁷ *Ibid.*

¹⁵⁰⁸ Henry F. Fradella, Lauren O'Neill & Adam Fogary, *The Impact of Daubert on Forensic Science*, 31 PEPP. L. REV. 323,361 (2004).

¹⁵⁰⁹ *Ibid.*

¹⁵¹⁰ *Ibid.*

¹⁵¹¹ *Ibid.*

¹⁵¹² Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,4 (2021).

¹⁵¹³ Derwin, Alexandra, *The Judicial Admission of Flawed Expert Opinion Evidence Informing Wrongful Convictions*, WJ LEGAL STUD. 1,19 (2018).

6.4 JUDICIAL ENGAGEMENT WITH FORENSIC EVIDENCE

It is generally recognised that judges are not only triers of facts and law but also science when it comes to expert testimony. The question as to how judges handle the issue relating to science in actual practice emerges. It is necessary to examine how judges make scientific determinations. The judges' approach to scientific matters deserves a thorough examination in the course of this study.

The participants of the survey study were asked about their approach to credibility determinations with respect to forensic evidence. The judges were prompted and encouraged to freely discuss the manner in which the evaluation of forensic evidence is done. One of the questions in the survey instrument in this regard was: *Is reliability of forensic evidence an issue of admissibility/weight?* None of the judges could readily comprehend the difference between admissibility and weighing. For instance, P10 and P11 mentioned that the question was not clear. The incomprehension is probably due to the kind of judicial system that operates in India. In the Indian legal system, the difference between admissibility and weight is not as important as it is in a jury system. The jury system is not present in India. Therefore, the task of admitting and weighing evidence is done by a single body, i.e., a judicial officer, unlike a jury system wherein the judge decides the issue of admissibility and the issue of weigh is decided by the jury.

A more direct question included in the survey was: *How is the reliability of forensic evidence assessed?* The aim was to ascertain the methods and strategies used by judges to handle forensic evidence. A majority of the judges (N=11) stated that one of the surest ways to gauge the reliability of forensic evidence is through the cross-examination of the expert.¹⁵¹⁴ P16 mentioned that the Indian judicial system is adversarial in nature and, therefore, it is for the parties to prove the reliability of the evidence. The remark is totally misconceived as the gatekeeping function may be a deviation from the adversarial system, yet it is very much part of a judge's responsibility. And, therefore, to shrug off this responsibility on the ground that the parties are responsible for producing before the court all the relevant information is legally untenable.

Responses from three participants (P4, P9 and P10) were insightful. The responses are:

¹⁵¹⁴ P3, P5, P6, P7, P8, P12, P13, P15, P16, P18 and P19.

- “Look for decisions of High Court and Supreme Court. If no authority of higher court is available, judges shall make use of the technique.” (P4)
- “Precedents of both HC and SC, look for other sources from google or friends, sources that can be quoted in judgments, books (such as Modi).” (P9)
- “Logic, common sense, corroborating evidence - all this together decides the final outcome of the case.” (P11)

Thus, as per these three participants, legal precedents, relevant literature, and logic are helpful in assessing the reliability of a forensic technique. It shall be noted that only one participant mentioned literature.

P1, P2 and P11 answered that the forensic technique based on which evidence is presented to them is generally not to be questioned.

- “General we don’t question the forensic technique. The general mind set is that forensic report is credible and shall not be easily negated. Judges have the discretion to not go by the forensic report. But, the technique is not generally questioned.” (P1)
- “Normally accused does not question the forensic report. The possession is contested. And the trial is decided on that basis.” (P2)
- “Forensic evidence is reliable. Its credibility cannot be questioned. No discretion with the judge.” (P11)

The responses of P1 and P2 suggest that, in most cases, the question of assessing the reliability of forensic evidence does not arise. The forensic techniques are presumed to be credible. It is the possession of the forensic evidence or other such factual matters that are contested. However, the question was meant to enquire about instances, though rare, in which the issue of reliability of forensic technique arises. Surprisingly, P11 strongly asserted that forensic evidence shall not be contest and the judge has no authority to question the credibility of forensic technique. This is a clear aberration from the gatekeeping function.

The remaining three participants had no personal experience of dealing with such a situation and therefore refrained from answering this question.¹⁵¹⁵ The following chart

¹⁵¹⁵ P14, P17 and P20.

presents a pictorial view of the variation observed in the responses of the participants. This chart demonstrates that reliance on cross-examination for assessment of the reliability of forensic evidence is the most prevalent practice, whereas only one participant showed an affinity to referring to scientific literature.

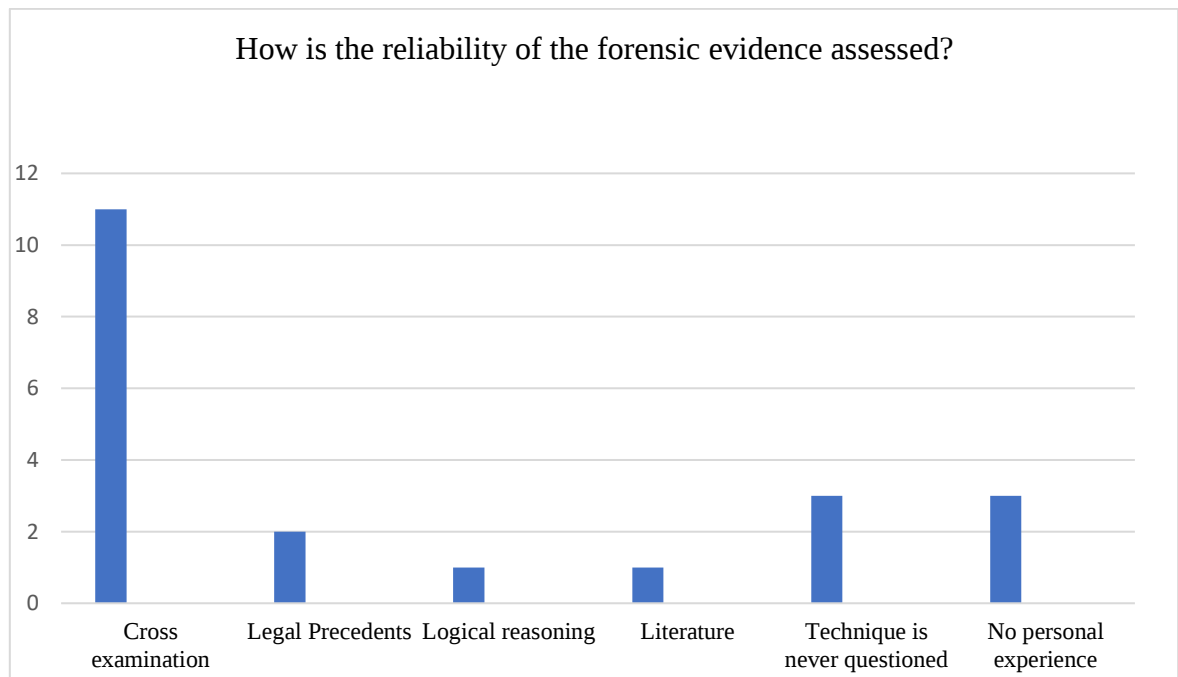


Figure 6-0-1

It is important to note that only one judge referred to a scientific method, such as the study of the scholarly research papers, as a means of assessing the credibility of the forensic evidence. Primarily, the courts rely on the cross-examination of the expert to gauge its credibility. In other terms, the credibility and reliability of the forensic technique and its application to the facts of the case are decided on the basis of the cross-examination of the expert. This is also evident from the rule of evidence that no expert evidence shall be relied on unless the expert testifies in the court.¹⁵¹⁶ It is only when the expert comes to court to testify that he can be cross-examined by the other party's counsel. As pointed out, in categorical terms, by P16, it is the job of the parties to question the credibility of the evidence. Thus, the gatekeeping function of a judge is

¹⁵¹⁶ *State of Maharashtra v. Damil S/o Gopinath Shinde & Others*, AIR 2000 SC 1691 at p. 1700.

relegated to the parties, because cross-examination is dependent on the proficiency, skills, and experience of the defence counsel.¹⁵¹⁷

Flaws in an expert testimony can be brought to light during cross-examination.¹⁵¹⁸ However, the over dependency on cross-examination is incorrect.¹⁵¹⁹ *Lirieka Meintjes-van der Walt* argues that cross-examination can be, at times, truth distorting in place of revealing the truth.¹⁵²⁰ The lie-exposing power of cross-examination has been called into question by *Schauer*.¹⁵²¹ He notes that it is fallacious to believe that flaws in expert evidence will be exposed by cross-examination or the presentation of counter-evidence.¹⁵²² There is no guarantee that a rigorous cross-examination would be able to expose the limitations of expert testimony.¹⁵²³ The counsel conducting the cross-examination has little capacity to unpack the flaws in a testimony based on a novel scientific technique, especially in light of legal standards or guidelines.¹⁵²⁴

Law demands that the task of the evaluation of forensic evidence shall be specifically performed by judges. The courts ought to look for first-hand information in relation to expert evidence rather than rely on information provided by party-generated witnesses.¹⁵²⁵ The same applies to reliance on the reasoning provided in the expert report. The report is prepared by the party-appointed expert. It is not feasible to expect that the report of the expert would include information concerning the limitations of the technique. It would most likely not include information that contradicts the report findings. Overall, an expert report would only be self-supporting and not present a wholesome picture. Fears expressed by *Jules Epstein* that “ongoing reliance on cross-examination as a great engine will, sadly, contribute to the continued phenomenon of

¹⁵¹⁷ Geert Philip Stevens, *The Role of Expert Evidence in Support of the Defence of Criminal Incapacity* (Feb. 2011) (Ph.D. Dissertation, University of Pretoria p 734.

¹⁵¹⁸ *Quiet Tech. DC-8, Inc. v. Hurel-Dubois UK Ltd.*, 326 F.3d 1333, at 1345.

¹⁵¹⁹ *Jackson v. Jackson* 2000 (2) SA 303 (SCA).

¹⁵²⁰ *Lirieka Meintjes-van der Walt, The Proof of the Pudding: The Presentation and Proof of Expert Evidence in South Africa*, 47 J. Afr. L. 88,100 (2003).

¹⁵²¹ *Schauer, Fredederick, Can Bad Science be Good Evidence-Neuroscience, Lie Detection, and Beyond*, 95 CORNELL L. REV. 1191 (2009).

¹⁵²² *Id.*, at 1193.

¹⁵²³ *Buckland, Prudence, Honeysett v The Queen (2014) 311 ALR 320: Opinion evidence and reliability, a sticking point*, 35(2) ADELAIDE LAW REVIEW 449,459 (2014).

¹⁵²⁴ *Ibid.*

¹⁵²⁵ *Schauer, Fredederick, Can Bad Science be Good Evidence-Neuroscience, Lie Detection, and Beyond*, 95 CORNELL L. REV. 1191,1193 (2009).

wrongful convictions based on eyewitness testimony”¹⁵²⁶ have been proved to be true.¹⁵²⁷ There have been incidents where cross-examination of the eyewitness could not expose the fallacies of their testimony.¹⁵²⁸ According to a review of expert testimony that resulted in erroneous convictions, adversarial systems have failed to vet defective testimony.¹⁵²⁹ During cross-examinations, defence counsel were unable to get information that would reveal flaws in the expert testimony.¹⁵³⁰ *Jane Campbell Moriarty* urges the court not to consider the problem of unreliable expert testimony as a simple one that cross-examination can resolve.¹⁵³¹ Report by authoritative bodies, the findings of Project Innocence and other empirical studies inform that cross-examination is ineffective in highlighting the flaws in methodology, bogus research and exaggerated claims made in the expert findings.¹⁵³² *McQuiston-Surrett and Saks* have concluded that even a well-designed cross examination cannot undo the impact of expert testimony even if the testimony is fraught with weaknesses.¹⁵³³

In an adversarial legal system, the problem of invalid forensic testimony is compounded by the fact that experts often choose to testify in accordance with the interest of the party hiring them.¹⁵³⁴ Expert testimony may be scientifically supportable.¹⁵³⁵ Yet, the expert would present to the court that extreme opinion within the range of possible interpretations that benefits their client.¹⁵³⁶

¹⁵²⁶ Jules Epstein, *The Great Engine That Couldn't: Science, Mistaken Identifications, and the Limits of Cross-Examination*, 36 Stetson L. REV. 727,784 (2007).

¹⁵²⁷ *SC grants bail to 77-year-old rape accused on DNA evidence*, The Hindustan Times, Aug. 25th, 2020, <https://www.hindustantimes.com/india-news/sc-grants-bail-to-77-year-old-rape-accused-on-dna-evidence/story-QA8hi6fi4fIITGntqKTlGI.html> (last visited Nov. 19th, 2022); Anuja Jaiswal, *U.P. – 2 years in jail for rape, DNA test proves man's innocence*, Time of India, Apr. 1st, 2021, <https://timesofindia.indiatimes.com/city/agra/in-jail-for-2-yrs-on-rape-charges-man-gets-bail-as-dna-test-proves-he-didnt-father-survivors-kid/articleshow/81784621.cms> (last visited Nov. 19th, 2022).

¹⁵²⁸ *Ibid.*

¹⁵²⁹ Garrett, Brandon L., and Peter J. Neufeld, *Invalid forensic science testimony and wrongful convictions*, VIRGINIA LAW REVIEW 1,10 (2009).

¹⁵³⁰ *Ibid.*

¹⁵³¹ Jane Campbell Moriarty, *Deceptively Simple: Framing, Intuition, and Judicial Gatekeeping of Forensic Feature-Comparison Methods Evidence*, 86 FORDHAM L. REV. 1687,1690 (2018).

¹⁵³² Gary Edmond & Mehera San Roque, *The Cool Crucible: Forensic Science and the Frailty of the Criminal Trial*, 24 CURRENT Issues CRIM. Just. 51,55 (2012)

¹⁵³³ McQuiston-Surrett D and Saks M, *The testimony of forensic identification science: What expert witnesses say and what factfinders hear*, 33 LAW AND HUMAN BEHAVIOR 436-53,439 (2009).

¹⁵³⁴ AVID L. FAIGMAN, *LEGAL ALCHEMY: THE USE AND ISUSE OF SCIENCE IN THE LAW* 26,54 (1999).

¹⁵³⁵ *Ibid.*

¹⁵³⁶ *Ibid.*

As noted in section 6.2, judges fully acknowledge that they have the duty to examine the credibility of the expert evidence. But the manner or method chosen to perform this duty is such that it is being relegated to the parties. There may be situations where an incompetent counsel does not thoroughly cross-examine the expert; the court would, in that case, readily admit the expert evidence without questioning it. This abdication of gatekeeping function is against the spirit of the rules of evidence. “Every trial is a voyage of discovery in which truth is the quest.”¹⁵³⁷ The ultimate aim of any judicial proceeding is to do justice and uphold the truth.¹⁵³⁸ Truth is the foundation of justice, and every possible effort shall be made to uphold the truth.¹⁵³⁹ There shall be no space for pollution/dilution in the stream of justice.¹⁵⁴⁰ Judges are duty-bound to seriously engage themselves in the search for truth.¹⁵⁴¹ “This is their mandate, obligations and bounden duty.”¹⁵⁴² The entire justice system will lose its credibility if people perceive that justice is not based on the foundation of the truth.¹⁵⁴³ A judge shall not simply preside over the court as an umpire in a competition between two adversarial parties and declare at the end who has won.¹⁵⁴⁴ A judge should take an active part in a trial to elicit the truth.¹⁵⁴⁵

The worthiness of cross-examination is diminished on account of the fact that defence lawyers are mostly not well-prepared, or proficient to bring to the knowledge of the judges the danger and lacunae hidden in expert testimony.¹⁵⁴⁶ Mostly, the counsels themselves, like judges, are not aware of the limitations and danger of faulty expert testimony.¹⁵⁴⁷ They rarely call an expert from their side to rebut the prosecution expert.¹⁵⁴⁸ Even if such counter experts are called to the court, their ability to identify and elaborate to the court the limitation of a defective expert testimony is doubtful.¹⁵⁴⁹ This peculiar situation requiring the defendant to discredit the expert testimony puts a

¹⁵³⁷ *Ritesh Tewari v. State of U.P.*, (2010) 10 SCC 677, para 30.

¹⁵³⁸ *A. Shanmugam v. Ariya Kshatriya Rajakula Vamsathu Madalaya Nandhavana Paripalanai Sangam*, (2012) 6 SCC 430, para 24.

¹⁵³⁹ *Ibid.*

¹⁵⁴⁰ *Ibid.*

¹⁵⁴¹ *Maria Margarida Sequeira Fernandes v. Erasmo Jack de Sequeira*, (2012) 5 SCC 370, para 33.

¹⁵⁴² *Ibid.*

¹⁵⁴³ *Ibid.*

¹⁵⁴⁴ *Mohanlal Shamji Soni v. Union of India*, 1991 Supp (1) SCC 271, para 10.

¹⁵⁴⁵ *Popatlal Jethabhai Shah v. State of Maharashtra*, 2006 SCC OnLine Bom 950, para 5.

¹⁵⁴⁶ Gary Edmond, *The Science of Miscarriages of Justice*, 37 U.N.S.W.L.J. 376,398 (2014).

¹⁵⁴⁷ *Ibid.*

¹⁵⁴⁸ *Ibid.*

¹⁵⁴⁹ *Ibid.*

resource burden on the defence.¹⁵⁵⁰ Thus, the responsibility of establishing the unreliability of expert evidence is transmitted to the other party.¹⁵⁵¹ This is contrary to the established rule of law that the burden of proving guilt shall be borne by the prosecution.¹⁵⁵² Thus, the judge's gatekeeping responsibility is transferred to the defence lawyer.¹⁵⁵³ In the words of *Buckland*, "in this way the defence is impelled to subsume the trial court's traditional gatekeeping function, scrutinising expert testimony to ensure the principles and methods so applied are 'reliable and applied reliably to the facts of the case.'"¹⁵⁵⁴

Judges seem to maintain a high degree of confidence in the adversarial mechanisms.¹⁵⁵⁵ Adversarial mechanisms or safeguards, such as cross-examination and the production of counter-evidence, are controlled by the parties to the litigation.¹⁵⁵⁶ A judge has little involvement in these procedures. Accordingly, the evaluation of the forensic evidence, if left to the mercy of adversarial mechanisms, would be dependent on the ability and competence of lawyers and not the actual gatekeepers. Advocates cannot be solely relied on to effectively vet experts in order to present a meaningful cross-examination. The chances that advocates do not thoroughly conduct the cross-examination are also very high, as advocates, just like judges, are not scientifically trained and lack scientific literacy. When the court solely relies on cross-examination for the evaluation of forensic evidence, the absence of challenge by the counsel of the opposite party could turn a *prima facie* proof of unreliable forensic testimony into conclusive proof. Thus, reliance on the cross-examination of the expert is not a safe alternative to gatekeeping by the judges themselves. The delegation of this responsibility on the ability of a counsel to effectively cross-examine the expert is a loophole in the system. It is a gap that may lead to a wrongful decision owing to reliance on faulty forensic evidence. The National

¹⁵⁵⁰ Gary Edmond, *Specialised Knowledge, the Exclusionary Discretions and Reliability: Reassessing incriminating expert opinion evidence*, 31(1) UNIVERSITY OF NEW SOUTH WALES LAW JOURNAL 1,39 (2008).

¹⁵⁵¹ *Ibid.*

¹⁵⁵² *Buckland, Prudence, Honeysett v The Queen (2014) 311 ALR 320: Opinion evidence and reliability, a sticking point*, 35(2) Adelaide L. Rev. 449,460 (2014).

¹⁵⁵³ *Ibid.*

¹⁵⁵⁴ *Id.* at 460.

¹⁵⁵⁵ Simon A. Cole & Gary Edmond, *Science without Precedent: The Impact of the National Research Council Report on the Admissibility and Use of Forensic Science Evidence in the United States*, 4 Brit. J. Am. Legal Stud. 585,617 (2015).

¹⁵⁵⁶ *Ibid.*

Academy of Sciences, in its report in the year 2009, noted that the adversarial process is not suitable for improving the quality of forensic evidence.¹⁵⁵⁷ The inability and incompetency of the lawyers in relation to scientific matters make it difficult for them to raise adequate challenges against forensic testimony or to effectively cross-examine the forensic expert.¹⁵⁵⁸ Lawyers, just like judges, are not trained to comprehend and evaluate forensic testimonies.¹⁵⁵⁹ The worries connected to the vulnerability of lawyers and judges analysing evidence that they are not equipped to evaluate are rising.¹⁵⁶⁰ In cases where an expert overstates or misstates the evidence, the chances that a lawyer would be able to point out the fault in the testimony are bleak. Additionally, in a criminal trial, the defence attorney is not always able to provide counter-expert evidence.¹⁵⁶¹ Thus, when attorneys are unqualified to appreciate forensic evidence, understanding the data underlying expert testimony presents a peculiar challenge.¹⁵⁶² Raising a sufficient challenge to the reliability of expert testimony requires scientific research and tremendous efforts.¹⁵⁶³ As per *Daubert* the responsibility to find flaws in the expert testimony is of the judge.¹⁵⁶⁴

Gary Edmond holds that in relation to expert opinion evidence, adversarial mechanisms are misconceived and perfunctory.¹⁵⁶⁵ The focus of the counsels of the litigating parties is on the chain of custody, demeanour of the witness, etc., and not on the basic methodological issues.¹⁵⁶⁶ *Gary* remarks that “plausible sounding responses and appeals to experience and personal authority often mark the practical limits of cross-examination.”¹⁵⁶⁷

¹⁵⁵⁷ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 100 (2009), at 12.

¹⁵⁵⁸ *Ibid.*

¹⁵⁵⁹ *Ibid.*

¹⁵⁶⁰ Paul Roberts, *Science in the Criminal Process*, 14 OXFORD J. LEGAL Stud. 469,470 (1994).

¹⁵⁶¹ Garrett, Brandon L., and Peter J. Neufeld, *Invalid forensic science testimony and wrongful convictions*, VIRGINIA LAW REVIEW 1,33 (2009).

¹⁵⁶² *Id.* at 89.

¹⁵⁶³ Caudill, D.S., *Lawyers Judging Experts: Oversimplifying Science and Undervaluing Advocacy to Construct an Ethical Duty*, 38 Pepp. L. Rev. 675,691 (2010).

¹⁵⁶⁴ Kapsa, Marilee M., and Carl B. Meyer, *Scientific Experts: Making Their Testimony More Reliable*, 35 CAL. WL REV. 313,326 (1998).

¹⁵⁶⁵ Gary Edmond & Mehera San Roque, *The Cool Crucible: Forensic Science and the Frailty of the Criminal Trial*, 24 CURRENT Issues CRIM. Just. 51,56 (2012).

¹⁵⁶⁶ *Ibid.*

¹⁵⁶⁷ *Ibid.*

It is important to bear in mind that trials are not always finely balanced.¹⁵⁶⁸ There are disparities between the litigating parties that often limit their capacity to hire the best counsel.¹⁵⁶⁹ The prosecution is better resourced and almost have complete monopoly over the use of government forensic labs.¹⁵⁷⁰ Thus the prosecution is mostly able to produce expert witnesses, whereas an accused may not be able to hire the services of a private expert. This disparity can result in the production of no counter-evidence or ineffective cross-examination.

Due to the fact that none of the judges cited any scientific approach for analysing forensic evidence and also to probe deeply, participants were asked to hypothetically respond as to what means/methods would be used to gain a thorough understanding of a forensic technique. It shall be borne in mind that participants were asked to hypothesise a scenario wherein they are scrutinising a newly introduced forensic technique, such as Gait. The participants were asked if at all they enter into a situation that demands evaluation of a forensic technique what tools they would employ.

The responses obtained from participants are

Response	Participant Number
Ask seniors	P1, P2, P9, P18, P19
Search online	P1, P2
Training	P2, P5, P12
Literature	P5, P8, P16
Logic and common sense	P3, P10, P13
Discretion of the judge	P4, P7, P15
Ask the expert	P11
No personal experience	P6, P14, P17, P20

Figure 6-0-2

¹⁵⁶⁸ *Ibid.*

¹⁵⁶⁹ *Ibid.*

¹⁵⁷⁰ *Ibid.*

Discussion with peers (judges/non-judges) is a commonly cited source of gaining scientific knowledge by the participants of the study. The judges appeared to be personal and subjective in their approach. There are a wide variety of replies that were received. Three judges mentioned that it was a matter of personal choice for the judge to choose from the available search options. Likewise, another judge mentioned that depending on the facts and circumstances of the case, the choice of research method would be decided. Three judges mentioned that the credibility decisions shall be made as per the training they had received. The notes from the training would be referred to by the judges. One judge mentioned that he would seek clarification from the expert himself. P7 said that:

- “Till the higher courts decided what is to be done a judge can rule the way they like. The matter remains in a grey area. After the Supreme court ruling. Judges have to go by the what higher courts say. If any new technique comes and that has not been held to be unconstitutional, I would admit it, just like any other expert evidence.”

Three judges mentioned that they would refer to the relevant literature as a primary source of information concerning the authenticity of the forensic technique. Of these three judges, one judge(P8) mentioned that book by *Modi* is the first thing to look at for information. The other judge(P5) mentioned that:

“Refer to the primary source i.e. literature and world over scientific opinion. And, see if the scientific opinion is divided or not. For example, in relation to impact of 5G on environment, opinion of scientific fraternity is divided.”

The responses of the judges are illustrative of the subjectivity inherent in the credibility assessments. There is tremendous scope for judges to reach widely disparate conclusions on the same facts and circumstances. There is no uniformity in the approach, probably because of a lack of guidelines or standards.

It is feared that, depending on the attitude and philosophy of a particular judge, the same forensic technique may meet different fates in different courtrooms.¹⁵⁷¹ Just as was seen in the previous chapter, section 5.4.1.2, that judge's perception with respect to fingerprint evidence was divided. Nearly half of the participants expressed high faith in the performance of fingerprint identification, whereas the other half asserted that corroboration of fingerprint evidence shall be sought for. The rule of law demands that there should be consistency and uniformity in the application of legal rules.¹⁵⁷² With a similar set of facts, the outcome of a trial shall be predictably similar.¹⁵⁷³ The same has been put most appropriately into words by *Mark A. Behrens & Andrew J. Trask* as: "When the rule of science is lost in the courts, so is the rule of law."¹⁵⁷⁴ *Kapsa, Marilee M. and Meyer, Carl B. (1999)*¹⁵⁷⁵ judicial officers do not have any specific training in science. The kind of scientific understanding that judges possess varies from judge to judge. Thus, the judicial decisions they make are bound to be non-uniform.

At the same time, data acquired via interviews with judges indicated that courts are lenient in assessing forensic evidence. It is interesting to note that P3 mentioned that

"Novel expert evidence is often not seen. The issues brought up in expert testimony are repetitive and opined by regular experts (e.g., drug trafficking practices by undercover law enforcement officers or cause of death by medical examiners."

This demonstrates that when a particular forensic technique is consistently offered in courts, the gatekeeping role devolves into a mechanical procedure. The court would be lenient in determining the veracity and significance of such evidence. It is critical to understand that the assessment of forensic evidence occurs on two levels. One is an evaluation of the technique's inherent reliability (foundational validity), and the other is

¹⁵⁷¹ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,5 (2021).

¹⁵⁷² Mark A. Behrens & Andrew J. Trask, *The Rule of Science and the Rule of Law*, 49 Sw. L.REV. 436, 436 (2021).

¹⁵⁷³ *Ibid.*

¹⁵⁷⁴ *Ibid.*

¹⁵⁷⁵ Kapsa, Marilee M. and Meyer, Carl B., *Scientific Experts: Making Their Testimony More Reliable*, California Western Law Review, Vol. 35: No. 2, Article 5, 326 (1999).

the technique's unique application to the circumstances of the case (validity as applied).¹⁵⁷⁶ Thus, even though the technique in issue is often employed in court, the court must always be wary of how the technique was applied to the circumstances of the case. Judges may have confidence in the forensic technique's reliability. However, each case presents a unique set of circumstances, and various experts employ the approach with varying degrees of success. As a result, a permissive attitude toward commonly employed techniques is not judicious.

Certain judgments of the High Courts and the Supreme Court of India have dealt extensively with the examination of forensic evidence. These judgments include information necessary to comprehend how the gatekeeping function is carried out. Though certain factors that may have weighed on the judge's mind while delivering these judgments may not find mention in the judgment. Nonetheless, the information included in the judgments is helpful in gaining an understanding of the gatekeeping process.

In the case of *Kumar Chandra v. State of Rajasthan*,¹⁵⁷⁷ the High Court of Rajasthan acquitted a woman of murder charges on the basis of legal insanity arising out of premenstrual syndrome (PMS) at the time of the commission of crime. The court, in order to assess the credibility of PMS as legal insanity, relied on studies and articles that were readily available online, despite the fact that these studies lacked rigour.¹⁵⁷⁸ The court took note of the use of PMS as a defence in other countries, such U.K., U.S. and Canada. But the court failed to notice that use of PMS in those countries is with respect to minor offences only, such as shoplifting. With respect to the scientific studies the court referred to, it is said that “the judgement relies on poor research and medical evidence that is dated and prejudiced.”¹⁵⁷⁹ One of the three experts who testified in court admitted that he was not an expert on the menstrual disease. The court has quoted an

¹⁵⁷⁶ President's Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods*, Executive Office of President 4, at xi (Sep. 2016).

¹⁵⁷⁷ 2018 SCC OnLine Raj 1899.

¹⁵⁷⁸ Ameyavikrama Thanvi, *Using Premenstrual Syndrome as Criminal Defence Is a Double-Edged Sword*, The Wire, <https://thewire.in/law/why-using-premenstrual-syndrome-as-criminal-defence-is-a-double-edged-sword> (last visited Nov. 19th, 2022).

¹⁵⁷⁹ Aarefa Johari, *Can premenstrual syndrome cause insanity? The problem with Rajasthan High Court's Judgement*, Scroll.in (Aug. 8th, 2018) <https://scroll.in/article/889490/can-premenstrual-syndrome-cause-insanity-the-problem-with-rajasthan-high-courts-judgment> (last visited Nov. 19th, 2022).

essay titled 'Exploring Premenstrual Syndrome in Criminal Law' published on 23.03.2015 in U.K. Essays, a trading name of All Answers Ltd. The court failed to take note of the disclaimer attached to the paper that it is a work of a student and not a professional.¹⁵⁸⁰ Reliance on a paper with uncertain credibility is not warranted specially when the impact of such a ruling could be vast. The judgment of High Court carried great precedential value for all the lower courts in the state. It is expected that the court should have been more rigorous and scientific in its approach. Another report titled 'Premenstrual Stress Syndrome as a defence in Criminal Cases' by Marc P. Press published in the Duke Law Journal (Vol.1983:176) has been quoted by the court. Astonishingly, the court has quoted the abstract of the report which is devoid of findings. This clearly shows the lack of actual engagement with the literature. Research paper prepared by Katharina Dalton on 'Menstruation and Crime',¹⁵⁸¹ which the court referred to was conducted in 1959. It is an old research paper. Also, the participants of that research were female who were accused of crimes such as alcoholism and prostitution. Further, the Indian study by Dr. Harinder Singh that court referred to was conducted on only 96 women.¹⁵⁸² The reliance placed on this study is misconceived.¹⁵⁸³ Again these participants were not accused or convicted of any crime.¹⁵⁸⁴ It appears that the only criteria for the selection of these studies for reference are their easy availability on the internet.

These judgments are illustrative of the perfunctory manner in which courts deal with science. This clearly showcases the lack of serious engagement with scientific literature and knowledge on the part of judges. The ability of a judge's mind to discriminate between reliable and faulty evidence shall dictate the quality of a judicial determination's result. A court must be able to weed out the untrustworthy portions of expert evidence. Additionally, the judge must be capable of appropriately determining the weight forensic evidence merits. A failure to do so is abdication of gatekeeping function.

¹⁵⁸⁰ *Ibid.*

¹⁵⁸¹ Dalton, Katharina, Menstruation and crime, 2.5269 BRITISH MEDICAL JOURNAL 1752 (1961).

¹⁵⁸² Singh Harinder, Walia Rani, Gorea RK, Maheshwari Annu, Premenstrual syndrome (PMS): The malady and the law, 26(4) JOURNAL OF INDIAN ACADEMY OF FORENSIC MEDICINE 129, 129 (2004).

¹⁵⁸³ Aarefa Johari, Can premenstrual syndrome cause insanity? The problem with Rajasthan High Court's Judgement, Scroll.in (Aug. 8th, 2018) <https://scroll.in/article/889490/can-premenstrual-syndrome-cause-insanity-the-problem-with-rajasthan-high-courts-judgment> (last visited Nov. 19th, 2022).

¹⁵⁸⁴ *Ibid.*

At this point, *Lirieka Meintjes-van der Walt's* comparison makes the most sense.¹⁵⁸⁵ He compares scientific evidence appraisal to choosing between chocolate cake, tiramisu, and other delights. He argues that tasting these delicacies is necessary in order to make an informed choice. Similarly, in law and science, credibility decisions must be made after actually delving into the functioning of the forensic technique.¹⁵⁸⁶ What *Lirieka Meintjes-van der Walt's* is trying to convey is that the judge shall engage with the methodology of the forensic technique in order to be able to make an accurate credibility assessment.

6.5 RELIANCE ON HEURISTICS/ABDICATION OF GATEKEEPING ROLE

Prior studies have shown that scientific evidence is hard to comprehend for judges, and resultantly, judges resort to other non-scientific methods of evaluating forensic evidence that are well-understood by them.¹⁵⁸⁷ Likewise, previous section 6.4, revealed that gatekeeping in practice is being conducted in ways that are not scientific. Judges depend on cross-questioning and the submission of counter-evidence in order to assess the reliability of forensic evidence. This is symptomatic of the fact that judges depend on heuristics for the examination of forensic evidence, such as the qualification of the expert and the reliance on legal precedence. Heuristics is “mental shortcuts relying on the fallacy of tradition.”¹⁵⁸⁸ It is believed that the employment of heuristics in the evaluation process can lead to decisions that are erroneous.¹⁵⁸⁹ *Oren Perez*¹⁵⁹⁰ gave a variety of strategy that a judge may employ in handling this complex task evaluating forensic evidence –

¹⁵⁸⁵ Lirieka Meintjes-van der Walt, *The Proof of the Pudding: The Presentation and Proof of Expert Evidence in South Africa*, 47 J. Afr. L. 88 (2003).

¹⁵⁸⁶ *Id.* at 88.

¹⁵⁸⁷ Erica Beecher-Monas, *Blinded by Science: How Judges Avoid the Science in Scientific Evidence*, 71 TEMP. L. REV. 55,56 (1998).

¹⁵⁸⁸ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc’y 1,5 (2021).

¹⁵⁸⁹ Jane Campbell Moriarty, *Deceptively Simple: Framing, Intuition, and Judicial Gatekeeping of Forensic Feature-Comparison Methods Evidence*, 86 FORDHAM L. REV. 1687,1690 (2018).

¹⁵⁹⁰ Oren Perez, *Judicial Strategies for Reviewing Conflicting Expert Evidence: Biases, Heuristics, and Higher-Order Evidence*, 64 Am. J. Comp. L. 75 (2016).

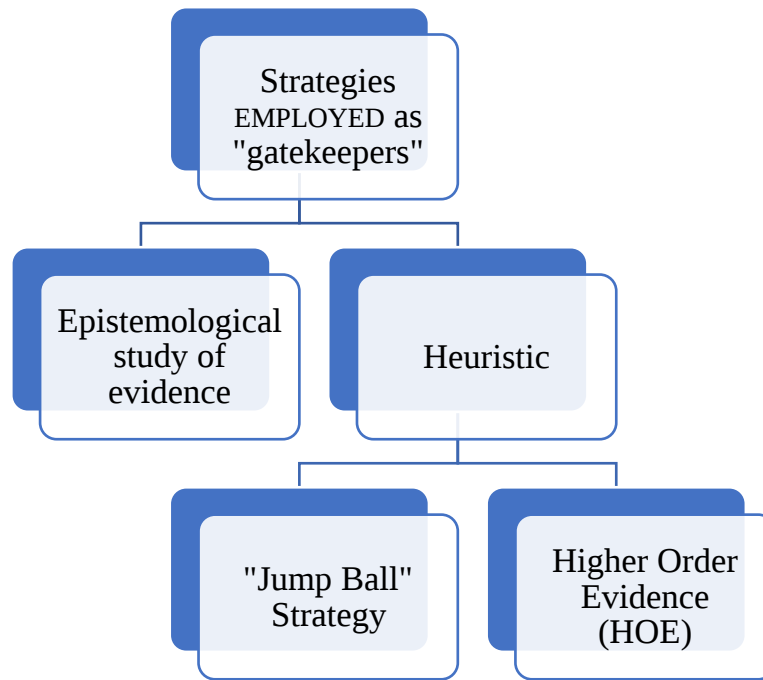


Figure 6-0-3

Epistemological study is direct analysis of epistemological value of evidence.¹⁵⁹¹ Whereas, the second strategy i.e. heuristics does not involve assessment of the quality of expert testimony.¹⁵⁹² In a study on Israel court in the contest of tort litigation, it was found that judges mostly employ heuristics to decide the issues related to expert evidence.¹⁵⁹³ Resultantly the second strategy does not lead to epistemologically correct decisions.¹⁵⁹⁴ This is further categorised into two types: one is Jump Ball Strategy and the other is Higher Order Evidence.¹⁵⁹⁵ Jump Ball is a term borrowed from Basketball. It is a rule that is used to resolve a conflict of opinions in the game.¹⁵⁹⁶

If no resolution is reached regarding who caused the ball to go out of bounds, a jump ball will be signaled between the two players involved at the nearest

¹⁵⁹¹ Oren Perez, Judicial Strategies for Reviewing Conflicting Expert Evidence: Biases, Heuristics, and Higher-Order Evidence, 64 Am. J. Comp. L. 75,78 (2016).

¹⁵⁹² *Ibid.*

¹⁵⁹³ *Ibid.*

¹⁵⁹⁴ *Ibid.*

¹⁵⁹⁵ *Ibid.*

¹⁵⁹⁶ *Ibid.*

circle. If the two players cannot be identified, the jump ball shall be administered at the centre circle between any two opponents in the game.¹⁵⁹⁷

This is a pragmatic method of dispute resolution.¹⁵⁹⁸ And, it has no concern with the merits of the dispute. For example, a decision about the issue of reliability of expert testimony based on age, race, appearance, gender, oratory skills of the expert.¹⁵⁹⁹ HOE is a strategy that adopts an indirect epistemic approach. For example, HOE would require a judge to see second order parameters such as reputation¹⁶⁰⁰, qualification in order to decide who is more reliable.¹⁶⁰¹ The logic behind this is that such parameters reflect the weight of their testimony. The choice made by the judge can be guided by various factors, like time and resource constraint, the utility or correctness of the epistemological approach etc.¹⁶⁰² Chris says that judges mostly take help of heuristics, which can lead to systematic errors in decisions.¹⁶⁰³

6.5.1 RELIANCE ON QUALIFICATION

The study's participants were questioned if the expert's credentials were a relevant criterion for determining its trustworthiness. Except for one judge (P2), all the others agreed that the expert's credentials were relevant for determining trustworthiness. P3 noted that, in addition to the expert's credentials, his experience is crucial. He stated that an expert's testimony gains value and credibility as a result of the number of times he has testified in courts. P4 said that the institution from where the expert received their degree, past experience, and educational background were all crucial variables. Additionally, P5 indicated that the expert's affiliation with an accredited or government institution lends credibility to his testimony. The single person(P2) who disagreed that the expert's qualification was a significant criterion offered an analogy. He said that, just

¹⁵⁹⁷ OFFICIAL RULES OF THE NATIONAL BASKETBALL ASSOCIATION 2015-2016, rule 2, s. IV(b), <http://mediacentral.nba.com/media/mediacentral/OfficialNBA-Rule-Book.pdf> (last visited Nov. 20th, 2022).

¹⁵⁹⁸ Oren Perez, Judicial Strategies for Reviewing Conflicting Expert Evidence: Biases, Heuristics, and Higher-Order Evidence, 64 Am. J. Comp. L. 75,78 (2016).

¹⁵⁹⁹ *Id.* at 79.

¹⁶⁰⁰ Margaret Bull Kovera & Bradley D. McAuliff, *The Effects of Peer Review and Evidence Quality on Judge Evaluations of Psychological Science: Are Judges Effective Gatekeepers?*, 85 J. APPLIED PSYCHOL. 574, 575 (2000).

¹⁶⁰¹ Oren Perez, Judicial Strategies for Reviewing Conflicting Expert Evidence: Biases, Heuristics, and Higher-Order Evidence, 64 Am. J. Comp. L. 75,109 (2016).

¹⁶⁰² *Ibid.*

¹⁶⁰³ Chris Guthrie, Jeffrey J. Rachlinski & Andrew J. Wistrich, *Inside the Judicial Mind*, 86 CORNELL L. REV. 777,787 (2001).

as a lower court's judgment on appeal is made on the merits and not on the basis of the trial court judge's experience or qualifications, the reliability of the expert witness may not be determined based on his qualifications or experience. Indeed, the expert's expertise, qualifications, and educational background are insufficient factors for determining their reliability.¹⁶⁰⁴

A judge is responsible for determining whether an expert is qualified to testify in court.¹⁶⁰⁵ The judges consider the expert's professional credentials and experience in determining whether he is a qualified expert.¹⁶⁰⁶ The primary objective of this exercise is to determine if the expert will be able to help the court with issues that are beyond the judge's expertise and experience.¹⁶⁰⁷ While training and certification are required to qualify as an expert, they are insufficient to ensure the credibility of expert evidence.¹⁶⁰⁸ Also, this approach cannot be adopted to assess the reliability of a technique since the judge is ill-equipped to discern between bogus competence and genuine credentials.¹⁶⁰⁹ *Paul Roberts*, in this regard, comments that: “the current system may well extend equal dignity to the opinions of charlatans and Nobel Prize winners.”¹⁶¹⁰

An empirical study by *Esther Nir & Siyu Liu*, published in 2021, showed similar results in the context of courts in the U.S.¹⁶¹¹ The study found that the admissibility standards, such as *Daubert/Frye*, have not been able to guide the judges in gatekeeping processes.¹⁶¹² The participants of the study discussed factors for the evaluation of expert evidence that were extrinsic to relevant factors, such as communication skills and showmanship.¹⁶¹³ These factors may reflect the expert's ability to testify eloquently in court but have nothing to do with the reliability of the evidence in essence.¹⁶¹⁴ The authors also found that the credibility assessment decisions were made in a subjective

¹⁶⁰⁴ Schwartz, Victor E. and Silverman, Cary, *The Draining of Daubert and the Recidivism of Junk Science in Federal and State Courts*, 35(1) HOFSTRA LAW REVIEW 217,270 (2006).

¹⁶⁰⁵ Paul Roberts, *Science in the Criminal Process*, 14 OXFORD J. LEGAL Stud. 469,481 (1994).

¹⁶⁰⁶ *Ibid.*

¹⁶⁰⁷ *Ibid.*

¹⁶⁰⁸ *Ibid.*

¹⁶⁰⁹ *Ibid.*

¹⁶¹⁰ *Ibid.*

¹⁶¹¹ Esther Nir & Siyu Liu, *What Do the Gatekeepers See? Perceptions and Evaluations of Scientific Evidence among State Court Judges*, 22 CRIMINOLOGY, CRIM. Just. L & Soc'y 1,11 (2021).

¹⁶¹² *Ibid.*

¹⁶¹³ *Ibid.*

¹⁶¹⁴ *Ibid.*

manner depending on the views and perceptions of the judge.¹⁶¹⁵ As a result, sometimes similar expert testimonies face opposite reactions from different judges regarding reliability.¹⁶¹⁶ The participants of the study by *Esther Nir & Siyu Liu* mentioned that their personal knowledge and experience had an influence on their decisions.¹⁶¹⁷ Therefore, there are stark differences in the outcomes of the gatekeeping functions.¹⁶¹⁸ These findings are similar to the ones echoed by the present study. There are others studies also that showcase the inability of the judges in the U.S. to assess the expert evidence based on the legal admissibility standards.¹⁶¹⁹ The judges in the U.S. also tend to rely on heuristics, like experience and credentials, for making credibility decisions.¹⁶²⁰ The reports by National Academy of Science has characterised the courts in the U.S. as thoroughly inefficient in driving the forensic science professionals to establish the validity or accuracy of the forensic techniques.¹⁶²¹

6.5.2 RELIANCE ON PRECEDENTS

Science and law differ from each other in many ways. One of the differences is that law relies on legal precedents as proof of reliability or trustworthiness, whereas in science, the significance of past findings is very limited.¹⁶²² The key issue that arises is that the ultimate conclusion, whether reliable or not, should be made using scientific standards rather than legal standards. The inquiry into the reliability of forensic evidence was meant to be a flexible inquiry.¹⁶²³ The judges have the discretion to choose the appropriate approach of evaluation based on the facts of the case.¹⁶²⁴ Reliability of evidence in itself is not a fixed or quantifiable entity.¹⁶²⁵ Resultantly, the test of reliability shall be designed as per the context.¹⁶²⁶ For instance, in a criminal case, the

¹⁶¹⁵ *Ibid.*

¹⁶¹⁶ *Ibid.*

¹⁶¹⁷ *Ibid.*

¹⁶¹⁸ *Ibid.*

¹⁶¹⁹ Gary Edmond, Simon Cole, Emma Cunliffe & Andrew Roberts, *Admissibility Compared: The Reception of Incriminating Expert Evidence (I.E., Forensic Science) in Four Adversarial Jurisdictions*, 3 U. Denv. Crim. L. Rev. 31, 40 (2013).

¹⁶²⁰ *Ibid.*

¹⁶²¹ *Ibid.*

¹⁶²² Sarah L. Cooper, *The Collision of Law and Science: American Court Responses to Developments in Forensic Science*, 33 PACE L. Rev. 234, 238 (2012).

¹⁶²³ Gary Edmond, *Deflating Daubert: Kumho Tire Co. v. Carmichael and the Inevitability of General Acceptance (FRYE)*, 23 U.N.S.W.L.J. 38,44 (2000).

¹⁶²⁴ *Ibid.*

¹⁶²⁵ Gary Edmond, *Deflating Daubert: Kumho Tire Co. v. Carmichael and the Inevitability of General Acceptance (FRYE)*, 23 U.N.S.W.L.J. 38,58 (2000).

¹⁶²⁶ *Ibid.*

requirement of the degree of reliability would be higher than the requirement in a petty civil matter.¹⁶²⁷ Thus, like relevance, reliability shall be determined as per the *in situ*.¹⁶²⁸

The flexibility does not, however, means that the judges have the discretion to abandon the gatekeeping obligation.¹⁶²⁹ Abandonment of this responsibility can have serious implications. The metaphor of gatekeeping itself implies the existence of an external threat, i.e., unreliable evidence.¹⁶³⁰ A court that relies on expert testimony without serious examination is said to be taking a step in the dark.¹⁶³¹

Historically, courts lacked adequate legal tools and guidelines for evaluating expert testimony.¹⁶³² Consequently, the judges have been applying legal standards and tools, such as the *doctrine of precedence*, to the assessment of scientific evidence as well. It is common knowledge that many times, the legal recognition of a forensic technique in a prior judgment is invoked in support of the admissibility of that technique.¹⁶³³ Experts claim that they have been testifying in courts for years and their evidence has been routinely admitted.¹⁶³⁴

There are two ways of evaluating scientific knowledge. One is “formal logic,” and the other is “rational evaluation.”¹⁶³⁵ The courts have been employing the logical approach. But, logic cannot accurately determine the worth of knowledge, especially because “science is a contentious process, rather than a catalogue of truths.”¹⁶³⁶ Judges who evaluate forensic evidence are supposed to advance to the level of young scientists.¹⁶³⁷ This is almost certainly a tedious duty, and judges are not currently prepared to conduct

¹⁶²⁷ *Ibid.*

¹⁶²⁸ *Ibid.*

¹⁶²⁹ Sarah L. Cooper, *The Collision of Law and Science: American Court Responses to Developments in Forensic Science*, 33 PACE L. REV. 234, 238 (2012).

¹⁶³⁰ *Ibid.*

¹⁶³¹ Zeffert, DT and Paizes, AP, *The South African Law of Evidence*, 309 (2nd ed. 2009).

¹⁶³² MJ. Saks, *The aftermath of Daubert: An evolving jurisprudence of expert evidence*, 40 JURIMETRICS 229,230 (2000).

¹⁶³³ Gary Edmond, *The Science of Miscarriages of Justice*, 37 U.N.S.W.L.J. 376,398 (2014).

¹⁶³⁴ *Id.* at 399.

¹⁶³⁵ Beyea, Jan, and Daniel Berger, *Scientific Misconceptions among "Daubert" Gatekeepers: The Need for Reform of Expert Review Procedures*, 64(2) LAW AND CONTEMPORARY PROBLEMS 327,360 (2001).

¹⁶³⁶ *Id.* at 328.

¹⁶³⁷ Dale A. Nance, *Reliability and the Admissibility of Experts*, 34 SETON HALL L. REV. 191,202 (2003).

it well.¹⁶³⁸ Complications and disagreements abound in the scientific literature.¹⁶³⁹ The issue is exacerbated by inflated assertions made by experts.¹⁶⁴⁰ The Supreme Court of India, in the case of *Shivaji Sahab Rao Bobade v. State of Maharashtra*, has also held that judges shall adopt a scientific attitude when they appreciate expert evidence.¹⁶⁴¹ Also, it is not necessary that the expert testimony was seriously evaluated in the previous judgment and, therefore, may not have precedential value. Traditional concepts, such as *stare decisis*, have been ineffective safeguards when faulty expert testimony is admitted in courts.¹⁶⁴² The legal commandment/requirement that judges shall engage with scientific concepts and literature actively has been little helpful in remedying this flaw in the system.¹⁶⁴³ The practice of citing supportive legal precedents has precluded the courts from indulging in first-hand information concerning expert evidence.¹⁶⁴⁴ Many scholars have been resonating on this concern relating to courts admitting evidence simply on the basis of the *doctrine of precedents*.¹⁶⁴⁵

In scientific matters, a ruling on the admission of expert evidence or technique in a prior case does not have any bearing on the validity or reliability of the technique.¹⁶⁴⁶ Yet, it was found that all participants of the study agreed unequivocally that legal precedent concerning the reliability of a forensic technique aided in the better understanding of the technique. An earlier decision, referred to as precedent, regarding the use of a forensic technique may not necessarily involve a serious review of the technique, and it may have been adjudicated according to the peculiar facts of the case.¹⁶⁴⁷ Therefore, a legal precedent shall not be used as laying down the law on admissibility of forensic expert

¹⁶³⁸ *Ibid.*

¹⁶³⁹ *Ibid.*

¹⁶⁴⁰ *Ibid.*

¹⁶⁴¹ *Shivaji Sahab Rao Bobade v. State of Maharashtra*, 1973 SCC (Cri) 1033; (1973) 2 SCC 793, para 11.

¹⁶⁴² Jason M. Chin & D'Arcy White, *Forensic Bitemark Identification Evidence in Canada*, 52(1) UBCL. Rev. 57, 99 (2019).

¹⁶⁴³ *Ibid.*

¹⁶⁴⁴ Michael J. Saks, *Merlin and Solomon: Lessons from the Law's Encounters with Forensic Identification Science*, 49 HASTINGS L.J. 1069, 1106 (1998).

¹⁶⁴⁵ Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Ruling from Jennings to Llera Plaza and Back Again*, 41 AM. CRIM. L. REV. 1189, 1195-97 (2004).

¹⁶⁴⁶ Edmond, *What lawyers should know about the forensic sciences*, 36(1) ADELAIDE LAW REVIEW 33,92 (2015).

¹⁶⁴⁷ *Ibid.*

testimony.¹⁶⁴⁸ Use of legal precedents as admissibility heuristics is ineffective in preventing exaggerated/unreliable expert testimonies from being considered by the court, especially when a courtroom setting is being ruled by technically-limited courtroom players.¹⁶⁴⁹ Reliance on precedents also gives rise to a credibility cycle,¹⁶⁵⁰ in which the actual credibility assessment of a technique may never happen and yet the expert testimony based on the technique gets perpetually admitted in courts. This circle never gets broken, and there is perpetual reliance on technique out “of legal (mis)understandings and premature legal recognition.”¹⁶⁵¹

The grave consequences of relying on precedent in scientific matters can be illustrated with the help of the two cases. One is *State v. Stinson* decided in 1985,¹⁶⁵² and the other is the 1992 conviction of *Levon Brooks*. The only direct evidence present in these cases was the testimony of bite-mark experts.¹⁶⁵³ Both the cases were proved to be wrongly decided based on the DNA evidence.¹⁶⁵⁴ *Stinson* was exonerated in 2009, i.e., 24 years after his conviction. *Brooks* was exonerated in 2008, i.e., 16 years after his conviction. The Mississippi Supreme Court, in the case of *Brooks*, relied on the reasoning presented in *Stinson* and other similar cases to issue a blanket pronouncement that “bite-mark identification is admissible in Mississippi.”¹⁶⁵⁵ Therefore, the court repeated the error that was made in earlier cases. Most surprising is the finding that *Stinson* and *Brooks* are being used as precedent and reliable authorities for the admissibility of bite-mark evidence.¹⁶⁵⁶ It is a travesty of justice that, despite exonerations in the two cases, *Stinson* and *Brooks*, and the availability of ample proof that bite-mark evidence present in the cases was spurious, courts have chosen to turn a blind eye to the factual and scientific reality, and have chosen to adhere to dogmatic legal tools for evaluation of evidence

¹⁶⁴⁸ *Ibid.*

¹⁶⁴⁹ *Ibid.*

¹⁶⁵⁰ Gary Edmond, *The Science of Miscarriages of Justice*, 37 U.N.S.W.L.J. 376,388 (2014).

¹⁶⁵¹ *Ibid.*

¹⁶⁵² 397 N.W.2d 136, 138 (Wis. Ct. App. 1986).

¹⁶⁵³ M. Chris Fabricant & Tucker Carrington, *The Shifted Paradigm: Forensic Science's Overdue Evolution from Magic to Law*, 4 Va. J. Crim. L. 1,7-8 (2016).

¹⁶⁵⁴ *Levon Brooks*, INNOCENCE PROJECT, <http://www.innocenceproject.org/casesfalse-imprisonment/levon-brooks> (last visited Oct. 9, 2015); *Robert Lee Stinson*, INNOCENCE PROJECT, <http://www.innocenceproject.org/Content/RobertLeeStinson.php> (last visited Oct. 9, 2015).

¹⁶⁵⁵ M. Chris Fabricant & Tucker Carrington, *The Shifted Paradigm: Forensic Science's Overdue Evolution from Magic to Law*, 4 Va. J. Crim. L. 1,9 (2016).

¹⁶⁵⁶ *Ibid.*

purported to be scientific. *M. Chris Fabricant & Tucker Carrington* refer to the practice of reliance on precedents in relation to expert evidence as ‘Echo Chamber.’¹⁶⁵⁷ This practice frustrates the mission of any legal system, which is to seek the truth. The two cases referred to above were ultimately reviewed and rectified. It is feared that there may have been cases where an innocent was wrongly executed before there could be a review.¹⁶⁵⁸

With respect to reliance on precedence, *Gary* holds that “structural symmetry is not the same as substantial fairness.”¹⁶⁵⁹ Allowing the presentation of erroneous or unreliable evidence and then depending only on legal tactics to justify the technique's continuous use in judicial proceedings creates a significant risk of the evidence receiving legal acceptance.¹⁶⁶⁰

The reports by National Academy of Science that discredited certain forensic techniques and questioned their foundational validity came as a surprise as the forensics has been in use for more than century.¹⁶⁶¹ And in all these years, forensics was being employed in courts without an iota of doubt. This failure to bring to the notice of the judges the flaws in the forensics all these years indicates that the trial mechanisms have some serious loopholes.¹⁶⁶² Judicial gatekeeping obligations, provisions for neutral experts, prosecutorial obligations, cross-examination, and provisions for review in the appeal could not prevent the wrongful convictions and miscarriages of justice.¹⁶⁶³ In fact, there is a continuation of reliance and acceptance of expert testimonies with unknown probative worth.¹⁶⁶⁴

¹⁶⁵⁷ *Id.* at 37.

¹⁶⁵⁸ Maurice Possley, *Fresh Doubts over a Texas Execution: New Evidence Revives Concerns That a Man Was Wrongly Put to Death in 2004*, WASH. POST (Aug. 3, 2014), http://www.washingtonpost.com/sf/national/2014/08/03/fresh-doubts-over-a-texasexecution/?hpid=z_1 (last visited Nov. 20th, 2022).

¹⁶⁵⁹ Gary Edmond, *Specialised Knowledge, the Exclusionary Discretions and Reliability: Reassessing incriminating expert opinion evidence*, 31(1) UNIVERSITY OF NEW SOUTH WALES LAW JOURNAL 1, 37 (2008).

¹⁶⁶⁰ *Ibid.*

¹⁶⁶¹ Gary Edmond, *The Science of Miscarriages of Justice*, 37 U.N.S.W.L.J. 376,404 (2014).

¹⁶⁶² *Ibid.*

¹⁶⁶³ *Ibid.*

¹⁶⁶⁴ *Ibid.*

Similar concerns apply to all common law nations as well. The fact that the U.S. has a jury system does not make any difference. Since identical difficulties may emerge in jurisdictions that do not employ jurors. The Law Commission in the U.K., in its report on issues concerning expert opinions, notes that “the use of the term “jury” should be taken to encompass lay magistrates and professional judges who sit as the factfinding tribunal in magistrates.”¹⁶⁶⁵

Thus, it is evident that courts do not execute their gatekeeping function seriously and efficiently.¹⁶⁶⁶ And, the general tools and insights used by a judge for assessing ordinary evidence are not a meaningful aid in appropriate evaluation of expert evidence.¹⁶⁶⁷ Thus, it has been time and again asserted that judiciary is not sufficiently prepared to undertake the role of a scientific evaluator. *Judge Domitrovich* holds that “somehow trial judges need to acquire the requisite tools and knowledge to assess the reliability of the methods used by forensic scientists and other experts. To do so, they need assistance.”¹⁶⁶⁸

There is no scientific finding that is not refuted or disagreed with. Subjectivity is inherent in the very nature of science, and therefore, controversies and contrary opinions are not hard to find.¹⁶⁶⁹ By its very nature “science thrives on disagreement and controversies”.¹⁶⁷⁰ As a result, if a party to litigation looks hard enough, it is possible to find an expert who would refute the findings of the expert of the other party.¹⁶⁷¹ The true picture would never get highlighted, unless of course the judge chooses to take an active part in the assessment of expert testimony. This is the surest and the only means to find

¹⁶⁶⁵ Law Commission, *Expert evidence in criminal proceedings in England and Wales*, 21 March 2011, Law Com No 325, 3 lawcommission.justice.gov.uk/areas/expert-evidence-in-criminaltrials.htm (last visited Nov. 20th, 2022).

¹⁶⁶⁶ Letter from Bradley D. Dantic, Vice-President & Gen. Counsel, ALPS Prop. & Cas. Ins. Co. et al., to Rebecca A. Womeldorf, Sec'y, Comm. on Rules of Prac. and Proc. (Mar. 2, 2020), https://www.uscourts.gov/sites/default/files/20-ev-bsuggestion_from_50_companies_-_rule_702_0.pdf (last visited Nov. 20th, 2022).

¹⁶⁶⁷ Gary Edmond, *Icarus and the Evidence Act: Section 137, Probative Value and Taking Forensic Science Evidence at Its Highest*, 41 MELB. U. L. REV. 106,111 (2017).

¹⁶⁶⁸ Justice Chris Maxwell, *Preventing Miscarriage of Justice: the Reliability of Forensic Evidence and the Role of Trial Judge as Gatekeeper*, (July 12th, 2017) <https://www.supremecourt.vic.gov.au/sites/default/files/assets/2017/10/a8/b8fd413aa/Preventingmiscarriagesofjustice.pdf> (last visited Nov. 20th, 2022).

¹⁶⁶⁹ Beyea, Jan, and Daniel Berger, *Scientific Misconceptions among "Daubert" Gatekeepers: The Need for Reform of Expert Review Procedures*, 64(2) LAW AND CONTEMPORARY PROBLEMS 327,340 (2001).

¹⁶⁷⁰ *Id.* at 340.

¹⁶⁷¹ *Id.* at 340.

out the actual probative worth of expert testimony. The judge shall engage with the testimony of expert judiciously and not in a perfunctory manner.¹⁶⁷² Keen and rigorous questioning of an expert about his findings and the basis of these findings may help in preventing the faulty expert testimony from being relied on.¹⁶⁷³ It is suggested that strict adherence to high standards of ‘beyond a reasonable doubt’ while admitting expert evidence.¹⁶⁷⁴ Both, undervaluation of reliable expert testimony and over-valuation of unreliable expert testimony, is disadvantageous to the litigating parties.¹⁶⁷⁵ The probative value assigned to expert evidence shall be based on cogent and justifiable scientific reasons.¹⁶⁷⁶

Moreover, in new and emerging areas of forensics, expert judgment will almost certainly be of questionable reliability.¹⁶⁷⁷ Without resorting to objective methods of examination, a tribunal of fact using heuristics will not be able to conduct a substantive evaluation of unique or unusual methodologies.¹⁶⁷⁸ This increases the likelihood that such evidence will be accorded greater weight than is reasonably justified.¹⁶⁷⁹

Given the scientific incompetency/illiteracy of judges, concerns have been raised with respect to the effective implementation of the widely used *Daubert* Criteria. Assigning gatekeeping function to judges implies a belief in the epistemic power of judges¹⁶⁸⁰ as they are supposed to play the critical role of gatekeepers.¹⁶⁸¹ Australia, England, and India, just as in the U.S., leave the discretion of admitting expert evidence to the courts, and that too, with very little statutory guidance.¹⁶⁸² Judge usually struggle with the scientific investigation that *Daubert* calls for. They, at times, incorrectly relate the methodological

¹⁶⁷² NLUJ LR, *Faulty Foundations: A Socio-Legal Critique of the Regulation of Forensic Science Laboratories in India*, 191,239 (2021); Brandon L Garret and Chris Fabricant, *The Myth of the Reliability Test*, 86 (4) FORDHAM LAW REVIEW 1559, 1576 (2018).

¹⁶⁷³ Kavita Pillai, *Another Competitive Enterprise: A Balanced Private-Public Solution to North Carolina's Forensic Science Problem*, (90) NCL Rev 253, 266 (2011).

¹⁶⁷⁴ *Ibid.*

¹⁶⁷⁵ *Ibid.*

¹⁶⁷⁶ *Ibid.*

¹⁶⁷⁷ Buckland, Prudence, *Honeysett v The Queen* (2014) 311 ALR 320: *Opinion evidence and reliability, a sticking point*, 35(2) ADELAIDE LAW REVIEW 449,461 (2014).

¹⁶⁷⁸ *Ibid.*

¹⁶⁷⁹ *Ibid.*

¹⁶⁸⁰ Oren Perez, *Judicial Strategies for Reviewing Conflicting Expert Evidence: Biases, Heuristics, and Higher-Order Evidence*, 64 Am. J. Comp. L. 75,77 (2016).

¹⁶⁸¹ *Id.* at 84.

¹⁶⁸² *Id.* at 85.

issues with the weight of the relevant evidence and not its admissibility.¹⁶⁸³ An epistemic conflict between experts in court poses a dilemma for the court. Failure to thoroughly and systematically understand forensic evidence threatens the integrity of the legal system.¹⁶⁸⁴ Most judges and litigators would admit that they do not have a foundation in science,¹⁶⁸⁵ but they fail to recognise that this can lead to communication problems.¹⁶⁸⁶ Lawyers would all believe that discussing the law with a non-law person is not a simple task, but they believe they can, by use of common sense and logic, understand scientific issues without training in a scientific manner. In scientific arenas, we can see that common sense is not so reliable. For instance, mixing two liquids, water, and alcohol, together should result in a solution whose volume should be the sum total of the volumes of those two liquids. But, in practice, we see that the resultant volume is smaller.¹⁶⁸⁷ The NAS report (2009) eleven times reiterated that

lawyers and judges often have insufficient training and background in scientific methodology, and they often fail to fully comprehend the approaches employed by different forensic science disciplines and the reliability of forensic science evidence.¹⁶⁸⁸

In almost every case where forensic evidence is being used, the competency of judges and lawyers in properly understanding the evidence is tested, as they all lack the required expertise to do so in an informed manner.¹⁶⁸⁹ One fine example in this regard would be the use of CBLA (Comparative Bullet Lead Analysis) evidence by the FBI (Federal Bureau of Investigation, U.S.) for 30 years in investigation and in court testimony.¹⁶⁹⁰ This technique was used to see whether the chemical composition of a bullet matched with that of the ammunition found with the suspect. It was only after one retired FBI expert

¹⁶⁸³ Jay P. Kesan, *An Autopsy of Scientific Evidence in a Post-Daubert World*, 84 GEO. L.J. 1985, 2040 (1996).

¹⁶⁸⁴ Id. at 234.

¹⁶⁸⁵ *Ethyl Corp. v. EPA*, 541 F.2d 1, 67 (D.C. Cir. 1976).

¹⁶⁸⁶ Richard Bjur & James T. Richardson, Expert Testimony Involving Chemists and Chemistry, in *EXPERT WITNESSING, UNDERSTANDING AND EXPLAINING SCIENCE* 41 (Carl B. Meyer ed., 1999).

¹⁶⁸⁷ J. PHILIP BROMLEY, *PHYSICAL CHEMISTRY* 252 (1984).

¹⁶⁸⁸ Jessica D. Gabel, *Forensiphilia: Is Public Fascination with Forensic Science a Love Affair or a Fatal Attraction?*, 36 NEW ENG. J. ON. CRIM. & Cry. CONFINEMENT 233, 258 (2010).

¹⁶⁸⁹ M.A. Berger and L.M. Solan, *The uneasy relationship between science and law: An essay and introduction*, 73 Brook. L. Rev. 847,852-853 (2008).

¹⁶⁹⁰ Giannelli, Paul C., *Comparative Bullet Lead Analysis: A Retrospective*, 47(2) Faculty Publications 306,306 (2010).

questioned the use of this technique that the National Academy of Sciences (NAS) was asked to study this technique. NAS found that testimony provided by an expert regarding CBLA in courts such as “could have come from the same box of ammunition manufactured on the same day¹⁶⁹¹, could have come from the same box of ammunition made by the same company¹⁶⁹²” were not statistically supported. Report concluded that, “the available data do not support any statement that a crime bullet came from a particular box of ammunition. In particular, references to ‘boxes’ of ammunition in any form should be avoided as misleading under Federal Rule of Evidence 403.”¹⁶⁹³ CBLA came to be discontinued in 2004, after the NAS report. Although the FBI stopped using CBLA, the Bureau’s conduct in first using the technique and then supporting it after it was challenged gives an insight into how forensic science at times works. And, how much harm such non judicious use of science in courts can cause. One disturbing case is that of *State v. Earhart*.¹⁶⁹⁴ It was a capital murder case, and CBLA evidence played a major role in the decision of the case. Earhart was executed before the publication of NAS report.¹⁶⁹⁵ This report by NAS shows the inability of the defence lawyers to find flaws in the expert testimony.¹⁶⁹⁶ The focus of the report can be said to be these two events: *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, a judgment that revolutionized the admissibility test for the admissibility of expert testimony, and DNA analysis, a technique that has led to a revolution in the world of forensic science.¹⁶⁹⁷

As per Harold (1996)¹⁶⁹⁸, the transmission of scientific knowledge from the expert to the court can be divided into three elements –

1. Source where such information is generated,
2. Communication of such information,
3. Apprehension of such information by the judge. This third element of apprehension by judges of information which is loaded with complicated and complex science-driven

¹⁶⁹¹ *State v. Grube*, 126 Idaho 377, 883 P.2d 1069, 1078 (1994); *People v. Johnson*, 114 Ill. 2d 170, 102 Ill. Dec. 342, 499 N.E.2d 1355, 1366 (1986).

¹⁶⁹² *U.S. v. Davis*, 103 F.3d 660, 666-67, 46 Fed. R. Evid. Serv. 189 (8th Cir. 1996).

¹⁶⁹³ *National Academy of Sciences, Forensic Analysis: Weighing Bullet Lead Evidence*, National Research Council, 6,7 (2004).

¹⁶⁹⁴ *Earhart v. State*, 823 S.W.2d 607, 614 (Tex. Grim. App. 1991).

¹⁶⁹⁵ Giannelli, Paul C., *Comparative Bullet Lead Analysis: A Retrospective*, Faculty Publications, 97 (2010), https://scholarlycommons.law.case.edu/faculty_publications/97 (last visited Nov. 20th, 2022).

¹⁶⁹⁶ *Ibid.*

¹⁶⁹⁷ *Ibid.*

¹⁶⁹⁸ Harold L. Korn, *Fact, Law and Science in the Courts*, 66(6) Columbia Law Review (Jun., 1966).

data is a major stumbling block to correct understanding and application of expert testimony.¹⁶⁹⁹

Pfefferli (2003) notes that the training module ought to be customised as per need of the trainee which would be both lawyers and judges. Advocates/lawyers would need to focus on the requirements and interpretation of evidence; while judges would be more interested in information that help them assess the scientific worth of such evidence.¹⁷⁰⁰ The assessment of reliability can present a major burden for trial court judges.¹⁷⁰¹ Several objections have been raised regarding the competency of judges to screen the expert evidence as good or bad. *Daubert's* critics often assert that judges cannot adequately perform the gatekeeper's role based on these factors.¹⁷⁰² Important here is to refer to the dissenting voice in the *Daubert's* judgment. Chief Justice Rehnquist raised this very objection and questioned the utility of imposing on judges "either the obligation or the authority to become amateur scientists in order to perform that role."¹⁷⁰³ Judges are devoid of scientific and technical training.¹⁷⁰⁴ Scholars say that the judges "do not think like scientists."¹⁷⁰⁵ And therefore lack the capacity to accurately evaluate the forensic evidence.¹⁷⁰⁶ As Professor Michael J. Saks notes,

Just as legal training teaches one the intellectual skills to analyze legal problems, scientific training teaches one how to analyse empirical questions and proposed answers. This places judges in a weak position to know what

¹⁶⁹⁹ *Id.* at 1083.

¹⁷⁰⁰ P.W. Pfefferli, *Forensic Education & Training of Judges and Law Enforcement Magistrates*, International Society for the Reform of Criminal Law, 17th International Conference, The Hague, 2 (2003), www.isrcl.org/Papers/Pfefferli.pdf (last visited Nov. 20th, 2022).

¹⁷⁰¹ Justin P. Murphy, *Expert Witnesses at Trial: Where Are the Ethics*, 14 Geo. J. Legal Ethics 217,227 (2000).

¹⁷⁰² Laurie Alberts, *Causation in Toxic Tort Litigation: Which Way Do We Go, Judge*, 12 Vill. Envtl. L.J. 33,44 (2001).

¹⁷⁰³ *Daubert v. Merrell Dow Pharm.*, 509 U.S. 579, 601 (1993) (Rehnquist, C.J., dissenting).

¹⁷⁰⁴ DAVID L. FAIGMAN, *LEGAL ALCHEMY: THE USE AND MISUSE OF SCIENCE IN THE LAW* 26, 56 (1999).

¹⁷⁰⁵ Michael J. Saks, *Merlin and Solomon: Lessons from the Law's Encounters with Forensic Identification Science*, 49 HASTINGS L.J. 1069,1136 (1998).

¹⁷⁰⁶ Sarah Lucy Cooper, *Judicial Responses to Shifting Scientific Opinion in Forensic Identification Evidence and Newly Discovered Evidence Claims in the United States: The Influence of Finality and Legal Process Theory*, 4 Brit. J. Am. Legal Stud. 649,685 (2015).

questions need to be asked in order to test an empirical claim or how to evaluate the data offered in answer.¹⁷⁰⁷

With respect to the scientific training of the lawyers, who play a crucial role in an adversarial process, Professor Frederic I. Lederer says "often places lawyers at a disadvantage when confronted with scientific evidence. Lawyers often fail to ask the right questions and uncritically accept scientific assertions."¹⁷⁰⁸ This lacuna is referred to as the math and science "black hole" in the system of legal education. "a black hole" that becomes harder to close the more removed it is from law school.¹⁷⁰⁹ Consequently, as Professor Jessica D. Gabel states, "As lawyers, we are ill-equipped to speak the language of science."¹⁷¹⁰

*Gatowski (2001)*¹⁷¹¹ gave some highly relevant findings that emerged from an empirical study done with 400 judges. The study was aimed at assessing the court's ability, the trial court's specifically, to evaluate the scientific reliability of scientific evidence. The survey vehemently suggested that difficulties are faced by judges in applying the *Daubert* criteria. Judges has very limited knowledge of practically applying these guidelines. These findings were reaffirmed by a review of case laws and judicial opinions. The writer says this is a cause of serious concern as to whether the judges are assessing scientific evidence correctly. The *Daubert* guidelines have to be first understood before it is applied and evaluated in a case. Without a sound foundation or the capacity to exercise the discretion that the courts have regarding the admissibility of forensic evidence, it would inevitably lead to inconsistent decisions and the mechanistic application of *Daubert* guidelines.

6.6 CONCLUSION

According to the above research, judges readily embrace and recognise their gatekeeping responsibilities. The problem is associated with the performance of this responsibility. Judges often execute gatekeeping in non-scientific or non-substantive

¹⁷⁰⁷ Michael J. Saks, *Merlin and Solomon: Lessons from the Law's Encounters with Forensic Identification Science*, 49 HASTINGS L.J 1069,1136 (1998).

¹⁷⁰⁸ Frederic I. Lederer, *Scientific Evidence--An Introduction*, 25 WM. & MARY L. REV. 517, 519-20 (1984).

¹⁷⁰⁹ Jessica D. Gabel, *Forensiphilia: Is Public Fascination with Forensic Science a Love Affair or a Fatal Attraction ?*, 36 NEW ENG. J ON. CRIM. & CONFINEMENT 257, 258 (2010).

¹⁷¹⁰ *Id.* at 258.

¹⁷¹¹ Sophia I. Gatowski et al., *Asking the Gatekeepers: A National Survey of Judges on Judging Expert Evidence in a PostDaubert World*, 25 LAW & HUM. BEHAVIOR 433,452 (2001).

ways, focusing on criteria unrelated to reliability. This may be due in part to a lack of legislative or regulatory guidance in this area. Additionally, the *Daubert* criteria are not used in practice by courts. There have been references to *Daubert* without the ruling's substance being applied. Scientific evidence is evaluated using second-order factors, such as qualification, reputation or heuristics. It is due to judges' lack of scientific knowledge that forensic evidence is evaluated using superficial criteria. The judges demonstrated a long-standing faith and trust in the trial systems' capabilities. Additionally, reliability decisions are subjective, which might result in conflicting evidentiary rulings. Considering the critical role of gatekeeping in judicial decision-making, it is critical that evidence accepted "through the gate" in court be trustworthy, credible, and dependable.

7.0 CONCLUSION AND RECOMMENDATIONS

Vigyan Sarvatra pujyate

The contributions of the forensic science community are important to the effective functioning of a judicial system.¹⁷¹² The study does not attempt to suggest differently. The prim

ary object of this study is to ascertain whether the Indian judicial system in its present state is suitable for facilitating the accurate evaluation of forensic evidence. The onerous nature of the task of evaluating forensic evidence was recognised by the Supreme Court of U.S. in *Daubert*.¹⁷¹³ The court held that "Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it."¹⁷¹⁴ Often, forensic science is seen as an obscure field of knowledge.¹⁷¹⁵ One of the U.S. High Courts has described forensic evidence as perplexing, deceptive, and mysterious.¹⁷¹⁶

Further, forensic science has been subjected to substantial criticism in the last few decades. The concern often boils down to the assertion that, historically forensic scientific information has not been presented and conveyed in a manner that

¹⁷¹² Harry T. Edwards, *The National Academy of Sciences Report on Forensic Sciences: What It Means for the Bench and Bar*, 51 JURIMETRICS 1,12 (2010).

¹⁷¹³ *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

¹⁷¹⁴ *Id.* at 595.

¹⁷¹⁵ *Tabatchnick v. G. D. Searle & Co.*, 67 F.R.D. 49, 55 (D.N.J. 1975).

¹⁷¹⁶ *State v. O'Key*, 899 P.2d 663, 678 n.20 (Or. 1995).

would enable judges to evaluate its veracity.¹⁷¹⁷ As a consequence, unqualified and exaggerated expert testimonies have led to many injustices in the form of wrongful judicial decisions.¹⁷¹⁸ Due to the emergence of DNA analysis, one of the few forensic technologies that is perfect science and has undergone rigorous validation testing, many of these wrongful convictions have come to light.¹⁷¹⁹ The conviction of an innocent person is worst of all societal injustices. A false conviction harms society as a whole since the actual perpetrator remains unpunished.¹⁷²⁰ Just as it is the court's responsibility to protect a real victim, it is also its responsibility to guarantee that an accused is only punished for the crime he committed.¹⁷²¹ In light of the astounding discoveries of the Innocence Project,¹⁷²² the issue of whether or not wrongful convictions exist is no longer debatable.¹⁷²³ According to a research, wrongfully convicted individuals suffer considerably higher irreparable psychological damage than survivors of serious physical trauma.¹⁷²⁴ This grim reality calls for immediate action.

The legal profession must be treated with as much seriousness as doctors and Chartered Accountants.¹⁷²⁵ An advocate's slightest error might have severe implications and may negatively affect his client's legal rights.¹⁷²⁶ Similarly, an error made by a judicial authority might be devastating to the accused person's life and freedom. Hence, it is sincerely urged that all possible steps shall be taken to leave room for errors in judicial decision making. The significant of making accurate scientific determination in

¹⁷¹⁷ Jason M. Chin, Gianni Ribeiro & Alicia Rairden, *Open Forensic Science*, 6 J.L. & Biosciences 255,256 (2019).

¹⁷¹⁸ Rachel Dioso-Villa, *A repository of wrongful convictions in Australia: First steps toward estimating prevalence and causal contributing factors*, 17(2) FLIN. L. J. 163 (2015).

¹⁷¹⁹ Committee on Identifying the Needs of the Forensic Sciences Community, *National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward*, National Research Council, 100,42-44 (2009).

¹⁷²⁰ Boaz Sangero & Mordechai Halpert, *Why a Conviction Should Not be Based on a Single Piece of Evidence: A Proposal for Reform*, 48 JURIMETRICS 43,46 (2007).

¹⁷²¹ *Jaga Arjan Dangar v. State of Gujarat*, MANU/GJ/08/2018.

¹⁷²² Kirk Odom, Innocent Project, <https://www.innocenceproject.org/cases/kirk-odom/> (last visited May 7, 2021).

¹⁷²³ Boaz Sangero & Mordechai Halpert, *Why a Conviction Should Not be Based on a Single Piece of Evidence: A Proposal for Reform*, 48 JURIMETRICS 43,47 (2007).

¹⁷²⁴ THE GUARDIAN, *The Birmingham Six: Have We learned From Our Disgraceful Past?*, <https://www.theguardian.com/theguardian/2011/mar/12/gareth-peirce-birmingham-six> (last visited Jun. 18th, 2022).

¹⁷²⁵ 184th Report, 2002, Law Commission of India, 184th Report, *The Legal Education and Professional Training and Proposals for Amendments to the Advocate Act, 1961, and The University Grants Commission Act, 1956*, 119 (2002).

¹⁷²⁶ *Ibid.*

a litigation is not limited to that particular case only.¹⁷²⁷ A wrongful determination does not only impact the rights of a party to the case, but also encourages similar misuse of forensic evidence in similar cases.¹⁷²⁸ Further loss of rule of science amounts to breach of rule of law as well.¹⁷²⁹

7.1 CONCLUSION

The methodology and the findings of the research have been summarised as per the research question.

7.1.1 WHAT ARE THE LEGAL PRACTICES FOR MAKING THE GATEKEEPING FUNCTION OF JUDGES MOST EFFECTIVE IN VARIOUS JURISDICTIONS?

The first research question is: what are the best legal practices for making gatekeeping function of judges most effective. To clarify, the gatekeeping function, in general, refers to a judge's responsibility to evaluate and assess the evidence. The objective of the research question was to document the laws and practices that are followed by various nations in relation to the evaluation of forensic evidence. The answer to this research was arrived at by conducting a doctrinal study of legal rules and the law-making judicial precedents of various nations. The jurisdictions chosen for the study were all common law jurisdictions that have a legal system similar to that of India.

The doctrinal study led to the conclusion that there are many similarities in the legal practices of these nations regarding forensic evidence. For instance, the gatekeeping function is a well-recognised principle of law in all nations that were studied. At the same time, there are certain peculiar dissimilarities and hence, the judicial evaluation of forensic evidence is based on varying considerations and rules. For instance, the law in the U.S. does not oblige an expert to owe allegiance to the court. Unlike other nations, experts in the U.S. do not have a duty to be truthful to the court. They are solely responsible to their clients. Unfortunately, it was found that the appointment of a neutral expert by courts is a less frequently followed practice in all the jurisdictions despite there being implied or express legal provisions for the same.

¹⁷²⁷ Federal Judicial, and National Research Council, *Reference manual on scientific evidence*, National Academies Press 4 (2011).

¹⁷²⁸ *Ibid.*

¹⁷²⁹ Mark A. Behrens & Andrew J. Trask, *The Rule of Science and the Rule of Law*, 49 Sw. L.REV. 436, 438 (2021).

The most important finding of this part of the research is that many nations, in the wake of wrongful convictions, have introduced statutory changes in the law to put more emphasis on certain aspects of evidentiary law. For instance, the introduction of a legal provision in Singapore that enables the judges to exclude expert evidence that is not ‘in the interest of justice’. Another example in this regard is the adoption of 19A of the Criminal Practice Directions and Rule 19 of the Criminal Procedure Rules in England, which relates to the duties of an expert to the court.

At the same time, the law relating to evaluation of forensic evidence has remained static in India. There has been no change in the law and legal practices with regard to assessment of forensic evidence. Many laudatory provision of law that relate to appoint of a neutral expert, standards of reliability, duties of an expert and judicial discretion to exclude prejudicial evidence have not been introduced in India.

7.1.2 HOW DO THE COURTS IN INDIA ASSESS THE RELIABILITY OF A PARTICULAR FORENSIC TECHNIQUE?

This research question required an in-depth study of the manner in which the reliability of forensic evidence is assessed. Hence, the answer to this question was sought by conducting both doctrinal and empirical research. The doctrinal part of the research involved an analysis of relevant judgments of the lower courts in New Delhi that were delivered between the period 2016 to 2020. And the empirical research involved interviews with judges from New Delhi. The findings arrived at from both the wings of the research were similar. Further, a few judges from other states were also interviewed to confirm if the findings were specific to New Delhi or were applicable to other states as well.

It was found that the sole and the most celebrated rule for the evaluation of forensic evidence is the rule of corroboration. This rule of prudence means that it is safe and preferable to rely on forensic evidence if there are other evidence that support or corroborate the forensic evidence. There are certain exceptions to this rule. Also, the rule is flexible in nature and is not a mandatory provision of law.

Another important finding was the lack of training in forensics among judges. It was found that judges are mostly graduates from non-scientific subjects. The training in

forensics by the judicial academy is limited to seven to fifteen days, inclusive of visits to the forensic laboratories. The refresher courses organised by judicial academy are not meant for all the judicial officers. The gatekeeping function is well recognised and appreciated by the judges. Although, the manner in which the gatekeeping function is performed is based on factors that are not suitable for the evaluation of forensic evidence, such as reliance on cross-examination, outdated legal precedents, or competence of experts. These factors may be termed as heuristics or short-cut methods. A sincere and serious engagement with scientific literature was found to be missing. The courts have failed to take account of the latest scientific literature on the reliability of forensic techniques and the element of subjectivity inherent in certain forensic examinations.

The courts are even reluctant to appoint a neutral expert in case there is a conflict between two opposing expert opinions or in cases where no expert is called to testify in court. Lastly, there are no standard guidelines for testing the reliability of the forensic technique. Reference has been made to *Daubert*¹⁷³⁰ in various judgments. But the reference has been superficial and meaningless as none of the factors discussed in the *Daubert*¹⁷³¹ has ever been applied.

7.1.3 WHETHER THE INDIAN LEGAL SYSTEM HAS ADEQUATE SAFEGUARDS/MECHANISMS TO SAVE IT FROM THE DANGER OF TOTALLY/PARTIALLY UNRELIABLE FORENSIC EVIDENCE/TESTIMONIES?

The number of wrongful convictions associated with forensic evidence in India is not known as there has been review of cases. The study is concerned about safeguards and awareness among the legal professionals in regard to these matters. The aim is to figure out if the Indian legal system has evolved with time to meet challenges posed by emerging scientific developments.

This research question is representative of the central concern of the research. An answer to this question has been sought by combining the results obtained from the other two research questions. In short, firstly, the relevant substantive law in India was compared with the law in other comparable nations. This exercise was meant to assess the legal

¹⁷³⁰ 509 U.S. 579 (1993).

¹⁷³¹ *Ibid.*

framework. It was found that the evidentiary legal framework relating to forensic evidence has not evolved with time, unlike in other jurisdictions. Secondly, the evidentiary rulings and perceptions of the judges were examined to ascertain if the evaluation of forensic evidence was in line with the latest scientific developments. It was found that there are lapses in the manner in which forensic evidence are evaluated. Overall, by combining the findings, it can be implied that the Indian legal system does not have adequate safeguards/mechanisms to save it from the danger of totally/partially unreliable forensic evidence/testimonies. In other words, comprehensive research into the issue of the assessment of forensic evidence has led to an unambiguous conclusion that the present legal landscape in India is vulnerable to wrongful convictions on account of the wrongful evaluation of forensic evidence.

7.2 RECOMMENDATIONS

The following are few recommendations that could improve the quality of assessment of forensic evidence and reduce the potential of miscarriages of justice due to flawed forensic expert testimonies.

7.2.1 STATUTORY INCORPORATION OF RELIABILITY AS CONDITION PRECEDENT AND DAUBERT STANDARDS

Traditionally, the tools or mechanisms provided by the common law systems for the evaluation of forensic evidence have been limited and injudicious.¹⁷³² The present research has shown that there is a lack of statutory guidelines for scrutiny of forensic evidence, and judges majorly rely on legal precedents, qualification of experts and other adversarial mechanisms. Till present date, the only provision of law in the Indian legal system that determines the admissibility and assessment of forensic evidence is section 45 of the Indian Evidence Act. This is an old and archaic provision that was drafted to deal with forensic techniques that were not as advanced as the techniques available today.¹⁷³³ The demand for introducing legal provisions to manage science and technology in courts has been raised by senior members of Supreme Court Bar

¹⁷³² M. J. Saks, *The aftermath of Daubert: An evolving jurisprudence of expert evidence*, 40 JURIMETRICS 230 (2000).

¹⁷³³ Shreya Rastogi and others, 'Forensic Science in the Dock: The Questions We Are Not Asking' LIVE LAW (2020) livelaw.in/columns/forensic-science-in-the-dock-the-questions-we-are-not-asking-161313 (last visited 31 Oct 31, 2020).

Association as well.¹⁷³⁴ Law, in order to remain useful, cannot afford to remain static.¹⁷³⁵ It must change and adapt to the new demands and needs of the society.¹⁷³⁶ Likewise, there is an urgent need for the law to reflect sound science.¹⁷³⁷

Science is transnational and universal in nature. It does not change from one territory to another.¹⁷³⁸ Consequently, the way law deals with science in other jurisdictions could be a useful guide for the development of the law in India. For example, *Derwin* has in relation to Canadian legal system has stated that new methods and practices employed in other nations can be adopted by Canadian courts to save the system from flawed forensic evidence.¹⁷³⁹

It is recommended that a rule incorporating reliability as a condition for admissibility as is provided in Rule 702 of the Federal Rules of Evidence may be added to the Indian Evidence Act. It states that:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

Such a provision shall also be accompanied by a comment or explanation that may explain the test of reliability in terms of the *Daubert* test. The *Daubert* standards were laid down in 1993. Rule 702 of the Federal Rules of Evidence was amended in 2000 to

¹⁷³⁴ *Experts Demand use of DNA evidence to solve crime in India*, THE HINDU, Nov, 1. 2017, <https://www.thehindubusinessline.com/business-wire/experts-demand-use-of-dna-evidence-to-solve-crime-in-india/article22220443.ece> (last visited Jun. 20, 2022).

¹⁷³⁵ *Karnail Chand v. State of Punjab*, 2011 (4) RCR (Cr) 527.

¹⁷³⁶ *Ibid.*

¹⁷³⁷ Stephen Breyer, *The Interdependence of Science and Law*, 280 Sci. 537, 538 (1998).

¹⁷³⁸ Mark A. Behrens & Andrew J. Trask, *The Rule of Science and the Rule of Law*, 49 Sw. L. REV. 436,452 (2021).

¹⁷³⁹ *Derwin*, Alexandra, *The judicial admission of flawed expert opinion evidence informing wrongful convictions*, 8 WJ L. Stud. 1,12 (2018).

incorporate the *Daubert* standards.¹⁷⁴⁰ These standards are equally valid and significant even in 2022, approximately 30 years after its inception.¹⁷⁴¹ The test has had a significant impact of the forensic evidence admissibility rulings. *Schwartz* notes that after the introduction of *Daubert* in the U.S., the courts are unlikely to admit forensic evidence merely on the ground that the expert has testified numerous times in other courts.¹⁷⁴² An imminent law professor *David Owen* believes that the *Daubert* standard has been successful in keeping flawed expert testimonies out of the courts.¹⁷⁴³ He notes that judges have become more serious and meticulous gatekeepers and there is stricter scrutiny of forensic evidence.¹⁷⁴⁴ Indeed, scrutiny of forensic evidence shall be scientific and not based on guesswork or heuristics.¹⁷⁴⁵

Several studies have been conducted to study the impact of *Daubert*. *Carol Krafka* in the year 2002, interviewed judges from federal district courts to assess the impact of *Daubert* on their evidentiary rulings.¹⁷⁴⁶ The study involved an interview with 300 federal judges. The results of the qualitative study were that post *Daubert*, the judges are more vigilant and active in their evaluation of expert evidence.¹⁷⁴⁷ Similar, in 2001, *Dixon and Gill* analysed decisions wherein expert evidence was challenges.¹⁷⁴⁸ This study also resulted in similar findings that scrutiny of expert evidence has tightened since *Daubert*.¹⁷⁴⁹

Recommendations to incorporate *Daubert* were made by the Law Commission in England.¹⁷⁵⁰ The Law Commission emphatically pointed out the need for specific rules for assessing the reliability of expert evidence. Interestingly, even the government

¹⁷⁴⁰ Stockdale, M., & Jackson, A., *Expert Evidence in Criminal Proceedings*, 80(5) THE J. OF CRI. L. 344–363,358 (2016).

¹⁷⁴¹ Schwartz, Victor E. and Silverman, Cary, *The Draining of Daubert and the Recidivism of Junk Science in Federal and State Courts*, 35(1) HOFSTRA L. REV. 219 (2006).

¹⁷⁴² *Id.* at 230.

¹⁷⁴³ David G. Owen, *A Decade of Daubert*, 80 DENVER UNIV. L. REV. 345, 362 (2002).

¹⁷⁴⁴ *Ibid.*

¹⁷⁴⁵ *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 319 (7th Cir. 1996).

¹⁷⁴⁶ Carol Krafka et. al., *Judge and Attorney Experiences, Practices, and Concerns Regarding Expert Testimony in Federal Civil Trials*, 8 PSYCHOL. PUB. POL'Y & L. 309 (2002).

¹⁷⁴⁷ *Ibid.*

¹⁷⁴⁸ LLOYD DIXON & BRIAN GILL, *CHANGES IN THE STANDARDS FOR ADMITTING EXPERT EVIDENCE IN FEDERAL CIVIL CASES SINCE THE DAUBERT DECISION*, (2001).

¹⁷⁴⁹ *Ibid.*

¹⁷⁵⁰ Law Commission, *EXPERT EVIDENCE IN CRIMINAL PROCEEDINGS IN ENGLAND AND WALES*, Law Com. No 325 (21 March 2011) lawcommission.justice.gov.uk/areas/expert-evidence-in-criminaltrials.htm (accessed on 30/10/2012).

conceded that the adoption of a statutory reliability test would mitigate the chances of error in decision making. It is believed that a statutory reliability test would ensure quality control at the outset as this would inform the litigating parties and the experts about the quality of the evidence they would adduce in courts.¹⁷⁵¹ *Daubert* was officially incorporated in law books in Florida in 2013 by virtue of the amendment.¹⁷⁵² In relation to South Africa, *Adebola Olaborede & Lirieka Meintjes-Van der Walt* have voiced their worries in the following words – ‘the South African legal system has much to learn from the admissibility criteria set out in *Daubert*.’¹⁷⁵³

Moreover, *Daubert* has already been approved by the Hon’ble Supreme Court of India in numerous judgments.¹⁷⁵⁴ But the application of the test to cases is missing. The courts merely tend to cite the *Daubert* test without applying it to the facts of the case. The incorporation of *Daubert* in the statute would ensure that *Daubert* is applied in actual practice in courts, especially lower courts.

7.2.2 TRAINING

The courts have remained indifferent and unperturbed by the growing criticism of the non-scientific nature of forensic sciences. One of the major reasons for this is the dearth of scientific training among the legal fraternity.¹⁷⁵⁵ Superficial analysis of the scientific matters by judges with the aid of adversarial safeguard may appeal to laymen.¹⁷⁵⁶ But this does not clarify the real issues relating to foundational reliability of forensic evidence.¹⁷⁵⁷ The inability to fully and substantively engage with forensic evidence has severe consequences. The sanctity of a judgment is attached to the capacity of a judge to rightfully appreciate and evaluate evidence.¹⁷⁵⁸ The judges mainly rely on the research

¹⁷⁵¹ Law Commission, *Expert evidence in criminal proceedings in England and Wales*, 7 (21 March 2011) Law Com No 325 (lawcommission.justice.gov.uk/areas/expert-evidence-in-criminal-trials.htm ac (last visited Oct. 30, 2012).

¹⁷⁵² THE FLORIDA STATE, <https://www.flsenate.gov/Committees/BillSummaries/2013/html/489> (last visited Jun. 20, 2022).

¹⁷⁵³ Adebola Olaborede & Lirieka Meintjes-Van der Walt, *The Dangers of Convictions Based on a Single Piece of Forensic Evidence*, 23 POTCHEFSTROOM ELEC. L.J. 1, 11 (2020).

¹⁷⁵⁴ *Mukesh and another Vs. State (NCT of Delhi) and others*, (2017) 6 SCC 1; *Dharam Dev Yadav v. State of UP*, 2014 (86) ACC 293 (SC); *Harjinder Kaur v. State of Punjab*, 2013(2) RCR (Criminal)146 (P&H HC); *Rajli v. Kapoor Singh*, (2014)174(2) PLR 575 (P&H HC).

¹⁷⁵⁵ Saks & David L. Faigman, *Failed Forensics: How Forensic Science Lost Its Way and How It Might Yet Find It*, 4ANNU. REV. LAW SOC. SCL 149,161-65 (2008).

¹⁷⁵⁶ Swinehart, Matthew W., *Reliability of Expert Evidence in International Disputes*, 38 Mich. J. Int’l L. 287,305 (2016).

¹⁷⁵⁷ *Ibid.*

¹⁷⁵⁸ Ian Binnie, *Science in the Courtroom: The Mouse That Roared*, 56 U.N.B.L.J. 307,327 (2007).

work done by the counsels on an issue, but the research work presented by counsels is often lopsided and does not present the complete picture.¹⁷⁵⁹ Imparting required scientific training shall facilitate in the process of evaluation of forensic evidence in a scientific manner. The initiative would help in making a court ‘science friendly.’ A knowledge base is required to be built among courtroom players so that they are comfortable with understanding and applying the basic scientific principles.¹⁷⁶⁰ Legal methodologies, thinking, definitions, and jargon are quite different from scientific methods.¹⁷⁶¹ For instance, the meaning of physical hurt and grievous hurt as defined by the Indian Penal Court may not be the same for a doctor. Likewise, the meaning of concepts such as evidence and truth is different in law and science.¹⁷⁶²

It is recommended that the judicial academy may impart regular and compulsory training to all judges in forensic techniques. The extent of training need not be the same as that imparted in medical or technical colleges. It could be limited to the extent that would enable judges to carry out gatekeeping function efficiently. Judges only need to become critical consumers of the forensic sciences.¹⁷⁶³ It is pertinent to mention the distinction between scientific literacy needed to carry out scientific experiments and scientific knowledge required to be able to critically examine forensic reports.¹⁷⁶⁴ Judges only need to know what to look for in an expert report and what are the relevant questions that they shall ask an expert.¹⁷⁶⁵

7.2.3 COURT APPOINTED EXPERT

The review of laws of various nations has made it clear that in most of the common law nations, including India, the law permit appointment of an expert by the courts. The most obvious advantage of taking assistance from a court-appointed expert is that they are not oriented towards either of the parties in a litigation and hence are not motivated to give

¹⁷⁵⁹ Janice Tibbetts, *Judges ignorant of science*, OTTAWA CITIZEN A6 (8 March 2003).

¹⁷⁶⁰ Canela, Carlos, et al., *How do legal experts cope with medical reports and forensic evidence? The experiences, perceptions, and narratives of swiss judges and other legal experts*, 10 FRONTIERS IN PSYCHIATRY 18,2 (2019).

¹⁷⁶¹ *Ibid.*

¹⁷⁶² *Ibid.*

¹⁷⁶³ Gatowski, Sophia I., et al., *Asking the gatekeepers: A national survey of judges on judging expert evidence in a post-Daubert world*, 25(5) L. AND HUMAN BEHAVIOR 433,455 (2001).

¹⁷⁶⁴ *Ibid.*

¹⁷⁶⁵ *Ibid.*

findings in favour of a particular party.¹⁷⁶⁶ But, the empirical study, i.e., interview with judges, has shown that this option is rarely exercised. Judges tend to rely on the findings of the party experts and in cases where the reports of two opposing experts are contradictory, the expert opinions are both discarded. The alternative choice of appointing an expert by court is not exercised in practice. It is recommended that the practice of appointing neutral experts by that courts shall be encouraged.

7.3 SCOPE FOR FUTURE RESEARCH

The present research on the issue is highly specific and by no means exhaustive. There is tremendous scope for further research on the issue. For instance, the study is limited to interview with judges. There may be study on the same issue incorporating the perceptions and opinion of experts and the public prosecutors concerning their experience with forensic evidence. Also, in the present study the case analysis of judicial decisions on forensic evidence was limited to District court in Delhi. Another study with a different court in focus can be designed. There could a study on how judicial appreciation of forensic evidence varies in higher courts *vis-à-vis* lower courts. Alternatively, there could be research on why forensic evidence are mostly used in criminal cases only. Further, there could be study specifically devoted to cases where court-appointed experts have been called to testify in court.

¹⁷⁶⁶ Canela, Carlos, et al., *How do legal experts cope with medical reports and forensic evidence? The experiences, perceptions, and narratives of swiss judges and other legal experts*, 10 FRONTIERS IN PSYCHIATRY 18,3 (2019).

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ANNEXURE A

Daubert Standards – The four non- definitive and non-exhaustive factors that were identified to be illustrative of characteristics of scientific knowledge by the US Supreme Court in the case of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*¹⁷⁶⁷

DNA exoneration - means proving a person innocent and his conviction flawed on the basis of DNA evidence.¹⁷⁶⁸

NAS – refers to document titled as “Strengthening Forensic Science in the United States: A Path Forward” authored by Committee on Identifying the Needs of the Forensic Sciences Community, National Research Council, USA in 2009

PCAST – refers to report titled “REPORT TO THE PRESIDENT Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods” by Executive Office of the President, President’s Council of Advisors on Science and Technology published in 2016.

Scientific evidence/forensic evidence – the terms have been used interchangeably.

¹⁷⁶⁷ 509 U.S. 579 (1993).

¹⁷⁶⁸ Saumya Singh & Rima Majumdar, *Innocence Project - Righting a Wrong*, 7 Nirma U. L.J. [11] (2018).

ANNEXURE B

CONSENT FORM

Dear Participant,

The participation in this study is voluntary meaning it shall be conducted with your consent only. The participant has a right to refuse to participate or withdraw any time in between the interview.

The tape recording of the interview shall be done only with the permission of the participant and not otherwise.

The name and other information that may identify the participant shall not be disclosed. Anonymity and confidentiality of the information shall be maintained at all times.

Ethical Clearance for conducting this study has been obtained from the concerned institution.

Signature of Interviewee

Date

ANNEXURE C

INTERVIEW GUIDE

The study is about the way forensic evidence are treated/dealt with in courts. To be specific, this study is an attempt to gauge the manner in which reliability of forensic evidence is assessed by judges.

Introduction Section

1. Age
2. Gender
3. Years in service
4. Experience as lawyer - if yes, how many years
5. Highest Educational Qualification
6. Additional Courses/diploma/training relating to forensic evidence/science
7. Scientific literacy

Main Questions

8. What kind of forensic evidences do you usually deal with?
9. As is provided by numerous legal precedents, forensic evidence are considered as secondary evidence? What does that mean in practise? Do you always look for corroboration?
10. What is your approach in case you are presented with contradictory evidences, one being direct and other being expert evidence?
11. Would you accept DNA evidence for decision making without corroboration?
12. Would you accept Fingerprint evidence for decision making without corroboration?
13. How many points of match in a fingerprint expert is good enough?
14. Would you accept Ballistic evidence for decision making without corroboration?
15. Would you accept Handwriting evidence for decision making without corroboration?
16. What is the role of a judge with respect to forensic evidence?
17. Do u see the role of judge as ‘gatekeeper’ as an appropriate one?
18. Is reliability of forensic evidence an issue of admissibility/weight?

19. How is reliability of forensic evidence assessed? Which methods/means would you employ to gain a clear understanding on a technical/scientific issue?
20. Does the presence of a legal precedence (judgment) on an issue, such as reliability of a forensic technique, help in building an understanding about the technique?
21. Do you feel the need for training on forensics?
22. Is the Daubert standard mentioned in few SC judgments a helpful criterion?
23. When do you think that court shall appoint a neutral expert?
24. How often do you think neutral experts are employed?
25. Have you ever come across a situation where there are contrary opinions given by experts of parties from both sides? How do you resolve this?
26. What do you do when none of the parties' proffer expert evidence?
27. Does qualification of an expert matter?

Thank you for participating in the survey. The information obtained in this interview shall be kept anonymous at all times and the identity of the participants would not be disclosed.

Date

Time

Duration